

**THE  
RAILWAY GAZETTE**

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INCORPORATING

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FRIDAY, NOVEMBER 11, 1960

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## Plans for the Railways

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**C**ESSATION in the rise in this country's industrial output is indicated in the Treasury estimate of production in September. There was no increase during the third quarter of the year compared with the second, which itself showed an increase of only 1 per cent over the first. Returns from the engineering and machine tool industries show that expansion has continued, with full order books reported by a good many firms. The curtailment of the expenditure on railway modernisation will adversely affect a good many firms in the engineering and allied industries which supply equipment to British Railways. Many of these moreover are facing acute competition in overseas markets, and have been relying on contracts with the British Transport Commission to afford long production runs, reduction in production costs, and experience afforded by the performance of their products on British Railways; all these factors are important aids to the success of British industry in securing orders overseas. The decline in demand for consumer goods is another factor which has limited production. The part played by the engineering industry, therefore, in maintaining and enhancing national prosperity, is the greater.

## Justifiable Expenditure

**C**OMPLETION of the first stage of the first major main-line a.c. electrification scheme in Britain, from Manchester Piccadilly to Crewe, in the London Midland Region, British Railways, was marked by a ceremony reported in our September 16 issue. The guests rightly included the civic heads of the communities and representatives of commercial and industrial undertakings in the area served, and principals and senior officials of the firms which supplied materials and equipment for the electrification. The function was criticised in Parliament last week by the Conservative Member for Manchester Moss Side, Mr. James Watts, partly on the ground that the money would have been better spent on more liberal superannuation for railwaymen. He reckoned that the British Transport Commission would have spent £18,000 on such celebrations by the time electrification was extended to London; but it is unlikely that completion of further stages, which will offer fewer novel features than did that of the first, will call for celebrations on a like scale. The amount of money allocated to publicity is a matter for management, as was pointed out by the Joint Parliamentary Secretary for Transport, Mr. John Hay; the Commission, he added, had something to publicise and a good story to tell. If the railways are to function as a commercial concern, their managements must be free to decide details such as the justification for expenditure of this kind.

## Three-Quarters of a Century of the C.P.R.

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into a nation. The new railway, built across a vast and largely unpopulated area, was built in prophetic anticipation of Canada's growth and of the flow of people and commodities from the United Kingdom and Europe and from the Far East and Australasia. One may wonder how far the men who built the Canadian Pacific foresaw the magnitude and scope of the C.P.R. undertaking as it is today. The purpose of the C.P.R. management over the past three-quarters of a century has been to create and expand not only a nation-wide railway but a system of 85,000 route-miles serving Canada and the world by land, sea, and air. In the railway sphere the C.P.R. has long been a pioneer in new developments, and notably, in recent years, in the application of diesel traction.

### Glasgow Suburban Electrification

**T**HE Glasgow suburban electrification, which was inaugurated on November 5, represents an important stage in the improvement of the traffic problem in that city, which has long provided a bottleneck approaching that of London in its density. The decision to electrify the uneconomic lines leading from the suburbs into the heart of the city was a courageous one for the British Transport Commission to take, and was not made until great thought had been put to the matter and the findings of the Inglis report of 1951 thoroughly taken into account. Speaking at the inaugural luncheon last Saturday, Sir Brian Robertson, Chairman of the Commission, stressed these facts and pointed out that further improvements, and would be made only if the new electrification was used to an economic extent. Agreeing with Mrs. Jean Roberts, the Lord Provost of Glasgow, who had spoken earlier, he said that he hoped the new trains and stations would be kept clean by the public, and added that the problem of litter on railway premises was one which was being tackled by the Commission in a drive throughout the country. In this task, British Railways needed the co-operation of the public.

### New Source of Traffic in West Wales

**W**HEN the Esso Petroleum Co. Ltd. oil refinery at Milford Haven, Pembrokeshire, opened last week by the Duke of Edinburgh, is in full operation, the outwards and inwards traffic moved by the Western Region, British Railways, is expected to amount to some 500,000 tons a year, including over 250,000 tons of fuel oil, kerosene, and motor spirit to concentration depots. British Railways is closely concerned with the new installation, which cost £18 million. Built on a 1,000-acre site it is designed to berth the world's largest tankers and to process, initially, 4½ million tons of crude oil a year. Large quantities of constructional material in the form of steelwork, steel plates, and pipes up to 84 ft. long were conveyed by rail to Milford Haven and delivered thence by road to site by railway cartage equipment, some of which was of a special character. The official opening incidentally created a minor movement problem, successfully solved, over lines with restricted carrying capacity. Six special trains, five from London and one from Cardiff, were run to West Wales for guests of the Esso Company, 500 of whom travelled from London, and for 320 employees of the caterers.

### Better Channel Islands Services

**A**LTERATIONS in the British Railways, Southern Region, Channel Islands steamer services take effect from next May. The South Eastern Area Transport Users' Consultative Committee has approved the railways' plans to operate the ships as a one-class semi-luxury service from Weymouth. A saving is expected of £200,000 a year on the passenger services, while the standard of comfort will be raised in a bid to persuade more people to travel by sea. By operating from Weymouth alone, instead of from both Weymouth and Southampton as at present, the Southern Region will be able to work the service with a much smaller fleet. The first of two new vessels, the *Caesarea*, will make its inaugural trip from Weymouth to Southampton next week. A third ship, the *St. Patrick*, built in 1947 and hitherto used in summer only, is to be re-fitted to afford the same standards of comfort. All three will have reclining armchairs to give passengers a comfortable night crossing. Catering facilities will include a cafeteria. In the summer there will be a day crossing in both directions

daily, with extra sailings at weekends and in the peak season. For the rest of the year there will be sailings every weekday, and thrice weekly between the end of October and mid-March.

### Broxbourne & Hoddesdon New Station

**P**ROVISION for road traffic, making the station a railroad in the full sense; new power signalling, with a telephone exchange accommodated in the signalbox; and a Flexiprinter ticket printing, issuing and accounting machine are some notable features of the new Broxbourne & Hoddesdon Station, Eastern Region, British Railways, opened last week. A description is given on pages 566-568. The station, on the Liverpool Street to Cambridge main line, on which a.c. electrified services as far as Bishops Cleeve are to be inaugurated next week, is the junction for the Hertford East branch, also electrified; and the opportunity was taken in planning to provide two island platforms, so that the Bishops Cleeve and Hertford East portion of multiple-unit electric trains could be divided or combined on the outer loop lines, leaving the centre tracks clear for expresses. Each platform accommodates an eight-car train, but provision has been made for possible extension to take 12 cars. Two separate corridors, one for passengers and one for parcels, are included in the bridge linking the booking hall with the platforms—an unusual feature in a station of such relatively small size.

### Track Maintenance in New South Wales

**T**HE most extensive mechanised track maintenance scheme yet introduced on an Australian railway system has been initiated by the New South Wales Government Railways Way & Works Branch. Over 532 miles of track are included in the plan which covers most of the lines in the Dubbo maintenance area, 287 miles from Sydney. The former track inspection and maintenance organisation working through small fettling gangs has been replaced by track supervisors whose main duty is to patrol a 60 to 90 mile length every two to three days. Several road masters have been appointed to control the maintenance of about 150 miles of line. Mechanised gangs have been set up to handle sleeper renewals and re-surfacing within the area while small mechanised maintenance gangs based on larger towns attend to the condition of the track. It is expected that the sleeper renewal gang will cover the whole area every four years, while re-surfacing will be undertaken on a two-year cycle. Introduction of the scheme should lead to greatly improved track standards and a considerable reduction in the cost of permanent way maintenance.

### Four-System Electric T.E.E. Trains

**T**HE first four-voltage multiple-electric T.E.E. ("Trans Europ Express") trains, being built by Swiss firms, are to go into service next summer between Paris and Milan via Lausanne and the Simplon Tunnel and between Milan and Zurich via the Gotthard. Details of the schedules are given on page 575. The full range of facilities will be necessary on the Milan-Paris journey, as the trains will run on 3,000-V. d.c. from Milan to the Swiss frontier; on 15-kV., 16⅓ c/s a.c. within Switzerland; on 25-kV. 50 c/s from Vallorbe to Dôle; and on 1,500-V. d.c. from Dôle to Paris. On the Milan-Zurich run only the Italian 3,000-V. d.c. and Swiss 15-kV. a.c. systems will be involved. To meet all these requirements the trains will have d.c. traction motors supplied direct from the overhead line d.c. sections, and through transformers and silicon rectifiers on a.c. The two a.c. voltages need not complicate the equipment to a great extent, because the different frequencies concerned compensate for changes in input voltage.

### Railways as Licensees

**T**HOUGH the granting of licences to manufacture patented or specialised products is an essential part of industrial life today, the general practice is for such business to be done between one manufacturer and another. Within the last five years or so examples have arisen of the grant of a licence between the originator and an operator—that is, a railway, and not always with the prime idea that the operator shall manufacture in his own shops. In the case of the licence for lightweight and specialised diesel locomotives granted by



Krauss Maffei to the British Transport Commission some four years ago, the idea certainly was to manufacture in British Railways works, and with construction not restricted to Swindon, which was doing the original work. Moreover, almost concurrently K-M licences were granted to two British builders. However, in Scandinavia, the Swedish State Railways has for some time had a Westwaggon licence for Minden-Deutz bogies; it has not yet built any in its own shops, but can place orders with any works in Sweden for bogies of this type for its own use, and the latest order placed under this licence is recorded this week in our Contracts and Tenders column.

### Post-tensioned Concrete Sleepers in Germany

**T**HE German Federal Railway administration, pioneers in concrete sleepers, used those of the pre-stressed type almost exclusively before 1955; nearly 1,500,000 were placed in service in that year. It was found, however, that these types suffered serious damage caused by a number of goods-train derailments about that time. Consequently a new type with higher resistance to derailment impact was sought, and the B55 type of post-tensioned sleeper was introduced, followed by the B58, with similar reinforcement but slightly higher tension, in 1958. Both these types are rigid beams with larger trapezoidal bearing areas than their predecessors, and sleeper-long U-rods arranged in a diagonal X in the section of the sleeper. This arrangement with the bonding possibly made these new sleepers much more resistant to derailment damage and generally superior to the pre-stressed types. By 1958, therefore, almost all the concrete sleepers purchased were post-tensioned, these being supplied by 11 private firms, who together turned out 2,200,000 for the Federal Railway in that year. They are being marketed in America by the U.S. Crosstie Company, of Milwaukee.

### Conversion of Electric System

**W**HEN the British Transport Commission decided in 1956 to adopt the 50-cycle a.c. system of electrification for British Railways, except for extensions to the Southern Region third rail network, work was well advanced on the extension to Southend Victoria of the Liverpool Street-Shenfield 1,500-V. d.c. electrification in the Eastern Region. When these lines were considered in relation to the national scheme it became apparent that they would have to be converted if a large area of the Eastern Counties was ultimately to obtain the benefits of the high-voltage a.c. system. For efficient working and maintenance of rolling stock and equipment all the lines must be electrified on the same system to provide flexibility in operation and make full use of the Ilford repair shops.

The formidable and complicated act of converting from d.c. to a.c. took place last week-end, from November 4 to 6. It had entailed about 18 months of physical preparatory work, posing many original problems to both technical and operating staffs to minimise inconvenience to the travelling public.

Work is now proceeding on the conversion between Shenfield and Chelmsford at 25kV. a.c.; this should be completed in about three months' time. Concurrently, the gap between Chelmsford and Colchester, whence the lines to Clacton and Walton were electrified at 25kV. a.c., last year, is being electrified and should be completed by early 1962, when through electric trains will run between Liverpool Street, Clacton, and Walton.

The conversion of the Liverpool Street-Chelmsford-Southend 1,500-V. d.c. lines is being carried out in two successive operations: Liverpool Street-Shenfield-Southend at 6.25kV., and Shenfield-Chelmsford at 25kV. The overhead line equipment work falls into four main groups: (1) Replacement of, or modification to, existing insulators not suitable for the increased a.c. voltages; (2) provision of neutral sections for sectioning between different sources of electrical supply; (3) altered switching and feeding arrangements; and (4) installation of booster transformers and return conductors.

For practical and economic reasons the existing copper section of the 1,500-V. d.c. equipment has been retained and little alteration has been necessary to the existing portal type supporting structures in the 6.25-kV. sections, Liverpool Street-Shenfield, and Shenfield-Southend. Structures in the section between Shenfield and Chelmsford, now to be energised at

25kV., have had additional equipment attached for the support of the catenary and contact wire. This arrangement is necessitated by the restricted boom/catenary clearances.

The Liverpool Street-Shenfield main-line section operates at 6.25kV., and the following insulators have been changed to withstand the increased voltage: (1) All diabolos insulators for supporting equipment where they are beneath bridges; (2) dumb-bell type span-wire insulators; (3) insulated knuckles; and (4) Permali beam-type section insulators.

The Shenfield-Southend Victoria branch line also operates at 6.25kV., and it has been necessary to change those dumb-bell type span-wire insulators which were directly over the tracks, and insulated knuckles.

The Shenfield to Chelmsford main-line section to operate at 25kV., requires major rehabilitation, the previous span-wire construction giving place to normal a.c. cantilever arrangement, but erected within the existing portal structures. All insulators previously installed for 1,500-V. d.c. operation are unsuitable for the increased voltage and are being replaced by standard types suitable for 25kV. a.c. Throughout the scheme, 33 neutral sections have been installed of both the over-lapping and section insulator types. The section insulator type neutral section has reduced the complication to the overhead line equipment involved, but its application is restricted to sections of line where normal running speeds are low. In general, the existing d.c. sectioning overlap spans have been retained, suitably altered to withstand the higher a.c. voltages by major replacement of the existing insulators.

Where possible new a.c. type isolating and feeding switches have been mounted on existing switching structures, but in some cases it has been necessary to install entirely new switching structures. To enable a quick change-over on conversion, duplicate feeding arrangements have been provided for the interim period. A large number of specially uprated a.c. isolating switches have been installed to carry the larger d.c. traction currents during this time. In accordance with standard arrangements, motorised switches are included at each neutral section. Booster transformers and return conductors have been installed on all sections of line, except from Bow Junction to Stratford. Booster transformers are installed at the lineside, approximately at two-mile intervals.

Modifications to existing bonding have been comparatively minor. Repositioning of certain bonds has become necessary because of the Signal Engineer's alterations to existing track circuits necessitated by the change-over from d.c. to a.c. All new overhead line structures have been bonded to rail in accordance with standard bonding arrangements.

Certain connections, sidings and loop lines have been additionally wired for electric traction coincident with the main conversion work. Of these the major item has been the wiring of the up and down Cambridge lines between Bow Junction and Stratford, and A and B carriage lines leading to Thornton Fields Carriage Sidings. Concurrent with the main work of conversion, contact wires in the Shenfield area have been lowered from 20 ft. to 18 ft. 6 in., so as to be commensurate with the maximum to be met on the new a.c. installations.

Power supply arrangements are substantially as for the 1,500-V. d.c. system, but the existing feeder stations at Bethnal Green, Stratford, Chadwell Heath, Gidea Park, Ramsden Bellhouse, Rayleigh, and Prittlewell, have been re-equipped with single-phase or Scott-connected transformers and 6.25-kV. oil circuit breakers in place of the rectifiers and d.c. high-speed circuit breakers.

The 1949 and 1956 1,500-V. d.c. stock is being converted to a.c. and 30 Shenfield three-car units have already been dealt with. These, together with a.c. four-car multiple-unit trains built for the London, Tilbury & Southend line, are being used to operate the Liverpool Street and Southend Victoria services until all the existing d.c. stock has been converted.

Under the 1,500-V. d.c. system, 50-cycle a.c. equipment was established for the colour-light signalling along the Liverpool Street-Chelmsford-Southend Victoria lines. Those parts of this equipment associated with the running rails essentially track and detection circuits, have been converted to 83½-cycle a.c. operation to render them immune first to the old d.c. traction current and now to the 50-cycle a.c. traction current. The line circuits, generally, have been converted to d.c. operation.

Yet another phase in the Eastern Region electrification plans will be completed on November 16, when Sir Brian

Robertson, Chairman of the British Transport Commission, officially inaugurates the a.c. electric passenger services on the lines between Liverpool Street and Bishops Stortford via the Southbury line, with the branches from Hackney Downs to Chingford, Bury Street Junction to Enfield Town, and Broxbourne Junction to Hertford East. A notable feature of this work is the re-opening for regular passenger traffic, after 40 years, of the former Church Bury Loop, now renamed the Southbury line. Five miles long, it leaves the Enfield Town line at Bury Street Junction, Edmonton, and links it with the Cambridge main line at Cheshunt. All electric trains to Bishops Stortford and Hertford East will travel over the Southbury line from Liverpool Street.

### Multiple-unit Developments for A.C. Traction

A STUDY of the various types of multiple-unit trains built for the suburban services of the British Railways 25-kV. electrification schemes reveals that, while certain well-established features of recent d.c. multiple-unit practice are retained, a number of interesting developments and new designs have been introduced.

The specification for these trains stipulated the use of certain standard items of equipment throughout and laid down definite requirements concerning the performance characteristics of the trains and the incorporation of particular features in the equipments. So far, four makes of electrical equipment have been built to conform with the requirements. Standard features used include pantographs, air-blast circuit breakers, and automatic power control, which are the same as those on the locomotives and have been referred to in our issue of October 21, 1960. All items of power equipment, except the roof equipment, had to be mounted on the underframe, which is of the standard British Railways centre-girder design. The restriction in space available with this design of underframe called for special development of the larger items, such as the main transformer and its associated cooling equipment, and the rectifiers, to enable them to be accommodated.

In all cases, the main transformer is of the forced oil-cooled type, of a long narrow shape, and arranged for tap-changing on the secondary winding. The primary winding is arranged in four sections for series or parallel connection as required by the value of the supply voltage. The transformer cooling oil is passed through radiators mounted on the underframe and cooled by motor-driven fans. Mercury-arc rectifiers are included in three makes of equipment, two of them being air-cooled and one water-cooled. Development of the semi-conductor rectifier had progressed to an extent which, as in the case of the locomotives, enabled one make of equipment to be fitted with this type of rectifier. As the result of subsequent development and experience, further applications of the semi-conductor rectifier are being made, some being of the germanium and others of the silicon type. A useful comparison between the mercury-arc and the semi-conductor rectifiers will, therefore, be possible under service conditions.

Although the traction motors follow, in the main, normal d.c. axle-hung practice, certain modifications have been introduced to ensure satisfactory operation on rectified a.c. Laminated commutating poles are fitted, and in some instances non-inductive resistors are connected to divert ripple current from the main field coils with the object of reducing motor losses and improving commutation. Smoothing reactors are also connected in the motor circuits to limit the ripple in the motor current. Various methods have been adopted to provide good adhesion. In one case all motors are permanently connected in parallel, while in the others they are in pairs in series with the interconnections between each pair of motors connected together. In two of the latter three arrangements, provision is also made for the automatic correction of wheelslip by relays energised by the unbalance current in the centre interconnection, which arrest the progression of the tap-changing mechanism. Further methods of wheelslip correction are being studied. The fitting of some motors with roller suspension bearings will enable their performance to be watched in comparison with that of the normal sleeve bearing.

The manufacturers have been free to select their own designs of tap-changing gear, and four different arrangements are used. One consists of contactors operated by motor-driven camshaft, another has contactors operated by a pair of e.p.-actuated cam-

shafts, while a third comprises individual e.p. contactors. A fourth variation consists of a combination of motor-driven camshaft and e.p. contactors. The automatic progression of the tap-changer is initiated and controlled by a compact master controller of the desk type, the main handle of which has four operating positions approximating to those of the d.c. multiple-unit controller with one weak field notch. Both the master controller and the e.p. brake controller are fitted with separate removable master keys, which lock them in the off or neutral positions.

The auxiliary equipment operates on a 240-V. a.c. supply from an auxiliary winding on the main transformer. The motors driving cooling fans and oil circulating pumps are of the capacitor start-and-run induction type, but the main compressor motors are d.c., fed through rectifiers. The train heating system is on the 240-V. supply, as well as the battery charger, which is of the static type with a transductor-regulated rectifier, and charges a 110-V. alkaline battery, and feeds the control and lighting circuits. An auxiliary compressor is supplied from the battery and its purpose is to charge the air system for the pantograph and air-blast circuit breaker during preparation for service to enable the pantograph to be raised.

Although the coach underframes are based on the standard British Railways centre-girder design, a departure has been made in the case of the bogies by the use of a double bolster design with the object of securing better riding characteristics. The motor bogies have main frames of riveted plate and rolled steel section construction, while the trailer bogies have pressed-steel frame members. One of the more obvious developments regarding the bodywork concerns the shape and appearance of the front end, a subject which appears to have received scant attention in the design of multiple-unit stock over the past years. Consideration of this matter has led to the introduction of inclined and curved leading ends, resulting in an improved appearance, despite the decision to adopt, in some cases, a four-digit route indicator.

The changeover of the 1,500-V. d.c. system to 50-cycle a.c. required special measures to be taken to convert the equipments of the trains on this line. As much of the original equipments is being retained as possible, with the addition of the necessary transformers, rectifiers, pantographs, and circuit breakers, the latter being of British design. The transformers are designed to give a 1,500-V. d.c. supply from the rectifiers which are of the germanium type.

### Indian Railways Passenger Traffic

OVERCROWDING of passenger trains is common in greater or lesser degree in all countries, but especially the less-developed areas. For instance, in India constant complaints about overcrowded lower-class carriages are received by all grades of the staff. Though overcrowding has occurred for very many years, it has undoubtedly become accentuated by the run-down of coaching and other rolling stock as a result of the 1939-45 war after a period of serious world depression. In 1938-39 18,654 coaches were in service on all gauges throughout India, but during the war large numbers were withdrawn and either sent overseas or because they had become worn-out and could not be replaced. Even after the war replacements were procurable only in small quantities, with the result that by 1953 the number on line had fallen by 12 per cent.

The population is increasing at the rate of 1.7 per cent per annum, and opportunities for employment are increasing extraordinarily rapidly. Consequently passenger traffic had expanded from 500,000,000 a year in 1938-39 to no fewer than 1,300,000,000 in 1957-58. It is clear therefore that so rapid an increase could not be met without super-human efforts, especially with the serious handicap of the set-backs just mentioned. In fact, in the light of a continued 8 per cent rise in population in five years, the 25 per cent average overcrowding would have been likely to become 33 per cent by April, 1961, had the railways not been so actively combating it.

There are other considerations. Even if sufficient coaches were available it would not be possible to increase train-lengths because the power of existing engines, lengths of platforms, yard layouts and strengths of tracks and bridges would forbid it. On the other hand, to increase the number of trains on a system composed almost entirely of single-track lines very heavy expenditure would be involved in increasing their capacity. Such expenditure will be provided for gradually,



but, all things considered, there is no immediate prospect of eliminating overcrowding in lower-class rail travel in the near future.

In the meantime everything possible is being done on all Indian railways to mitigate the discomforts of the travelling public. Reserved seats or sleeping accommodation are available at little or no extra charge, even to third-class long-distance passengers, and fans and better lighting in all carriages are being provided as well as better amenities at stations. In fact, there is no doubt that Indian railways are doing all in their power and within the resources available to lessen overcrowding and make travel by rail as comfortable as can reasonably be expected. Meanwhile passengers can do much themselves to ease the situation by putting all boxes, heavy and bulky luggage in the guard's van instead of on seats, by not spreading themselves or acting selfishly in other ways, by dissuading others from unnecessarily pulling alarm chains, and by reporting people travelling without tickets and thus aggravating the problem.

### The Sudan Railways in 1957-58

THE report of the Sudan Railways for the year to June 30, 1958, a copy of which was recently received by us from Mohed. El Fadl, the General Manager, records that the period was the best ever in the Railways' history. The tonnages of goods handled and the number of passengers carried well exceeded the previous record set up in 1956-57. Passenger journeys went up by 3.6 per cent. Import traffic increased substantially, in contrast to a sharp drop in export traffic, while internal traffic diminished slightly. All branches of the system worked to full capacity to keep up with the unprecedented increase in traffic, and the heavy development programmes of the country. Throughout the year goods offering were "overwhelming," and the Administration's resources were severely strained.

Gross revenue of £512,140,846 was up 11.8 per cent to the highest ever achieved. After deducting working expenses of £58,930,867 (up to 10.1 per cent), the operating surplus of £53,209,979 was £5463,415 more than in the previous year. The net revenue of £52,382,874, after interest charges, was only £538,109 below the peak year 1955-56, and exceeded that of 1956-57 by £5404,933, or 20.5 per cent. Higher revenue accruing from the import traffic more than offset the deficit due to the decrease in exports. It is significant that working expenses went up 10.1 per cent, but net revenue by 20.5 per cent.

Recorded total capital expenditure increased during the year under review by £54,294,225 to £534,940,439, over half of the 1957-58 outlay being on the permanent way. With the development of new irrigated areas by the Government and private investors, the volume of traffic is likely to increase further during the next few years, and the public transport system is planning to meet the still higher demand which is expected.

Three third-class and nine fourth-class coaches were added to the coaching fleet. Two engines were scrapped, reducing the main-line fleet in service to 154. Four shunting engines were added, bringing the shunting engines' figure up to 48. Despite the considerable trouble caused by the 42 new "500" Class engines (27 of which had to be withdrawn from service during January and February because of cracking of firebox plates) the increase in traffic demands was handled to the best possible degree. The river service returned an operating deficit of £5134,606, a result considered satisfactory as the ratio of expenditure to earnings dropped from 124.9 to 122.5 per cent. The Port Sudan financial results were "very satisfactory," the operating surplus more than doubling at £5917,450.

The General Manager states that with the continuing growth in the economy, there is clear indication that agricultural and industrial development will expand further in the years to come. The country possesses vast agricultural and pastoral resources which have not yet been fully exploited, and by continuous increase of capacity and efficiency the Railways management are ensuring that there should be no check to the development.

During the year the Egyptian Government debt of £53,389,855 was fully redeemed after the introduction of the Sudanese currency. The management is aiming at keeping a net revenue figure of not less than £51,250,000, as credit-worthiness must be maintained to enable additional capital

to be borrowed as necessary to increase capacity and extend the network.

The following are some of the principal results for 1957-58 compared with the previous year:—

	1956-57 (Thousands)	1957-58 (Thousands)
Total train kilometres	8,336	8,823
Passengers carried	160,653	165,321
Goods tonnage	1,744	1,772
	(£ Thousands)	(£ Thousands)
Traffic receipts	8,272	8,893
	Km.	Km.
Km. open at year-end	3,797	3,988

### Gloomy Outlook for American Railways

(By a correspondent)

THE report on the transport situation, issued by the Association of American Railroads in September, shows that in the first 35 weeks of this year the railroads forwarded 20,949,620 wagons under load, 253,410 fewer than in 1959. The decrease of 1.2 per cent is serious, for 1959 was a poor year with loadings running about 13 per cent below 1957.

With the resumption of work in the steel industry, imported ore for rail movement during seven months of 1960 totalled 11,594,000 tons, a rise of 14 per cent. In 35 weeks 415,430 more wagon loads were dispatched, an increase of nearly a third. Coal loadings increased by 17,350, or 0.5 per cent, and coke loads by 5,080, or 1.5 per cent. Though some crops in the U.S.A. were good, grain loadings were down 39,120, or 2 per cent.

The uncertain state of the national economy at present is proved by a fall of nearly 414,000, or 3.7 per cent, in loadings of miscellaneous and manufactured goods. Another sign was a drop of 187,360, almost 13 per cent, in the number of wagons carrying "small"; at this rate less-than-wagon-load traffic may vanish soon.

Trailer-on-flat-wagon loads to September 3 numbered 370,380, compared with 274,485 "flats" in 1959, an increase of 34.9 per cent. Overseas export coal for eight months of 1960 totalled 17,031,090 tons, a decrease from last year's shipments of fully 5 per cent. Export and coastal freight traffic handled at ocean ports (other than coal) filled 1 per cent more wagons in August. The user of refrigerator cars on the other hand was nearly 3 per cent less in July and August.

In existing conditions the railroads have little incentive to strengthen their wagon stock. At September 1 they owned 1,671,780 wagons, 30,000 fewer than a year ago. The number under repair was 147,950, nearly 9 per cent of ownership. That left 1,523,830 wagons fit for service, 35,166 less than a year ago. The number of new wagons on order was 21,600 against 42,320 a year earlier. There is a risk of the wagon equipment being unduly weakened, as it was after the lean traffic year 1954.

After February the financial position of the railroads, judged by earnings before charges, deteriorated rapidly. At the end of March these earnings were \$7.8 million, 5 per cent less than in 1959. By July 31 the decrease expanded to \$108 million, or 23 per cent. Total operating revenues were then \$199.6 million, or over 3 per cent lower, freight revenue being down by \$196.8 million, or 4 per cent, and takings from passenger train service, including mails and parcels, less by \$2.5 million, about half of one per cent. Expenses were reduced by \$94 million, 2.1 per cent, and Federal income taxes decreased by \$40 million, more than a fifth.

The outcome of these changes was a fall in net railway operating income (earnings before charges) to \$354 million. The number of Class I railways in deficit rose from 13 last year to 21. As soon as the operating ratio of a railroad rises to 85 per cent trouble begins as the Erie found in July when it was short of nearly a million dollars. At the same time the New Haven was \$9.7 million in arrears, a desperate position contrasted with deficits of about \$2.5 million on the Lackawanna and Lehigh Valley.

At the time of writing the only railroad free from anxiety seems to be the Norfolk & Western, which scored through its merger with the Virginian in December. The amalgamation gave a unique chance for economising. Operating expenses were cut by 5 per cent to July 31 and their ratio to revenue held



no less than 60 per cent, so that earnings were 4 per cent higher in spite of a \$2 million fall in freight revenue. Its rival coal road, the Chesapeake and Ohio, lost 2 per cent of its freight revenue by the end of July but operated at a ratio of 75 per cent, so that its earnings were 13 per cent lower.

In all probability the September and October statements of revenue and expenses will reveal the railroads, especially in the Eastern District, as struggling with an accumulation of difficulties. The financial problem has raised afresh the question

of grouping the railroads into a limited number of combines, which was mooted after the first world war. In the meantime a straightforward merger of the Erie and Lachawanau as from October 15, though approved by the Interstate Commerce Commission as from October 15, may be delayed because a Federal Court is to hear an appeal on November 15 for what is termed a "four year job freeze" for employees of the two companies. It will be instructive to hear how this test case is decided.

## LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

### Pullman Services

November 4

SIR,—I refer to the letter from Mr. J. H. Brebner published in your issue of November 4.

From its penultimate paragraph one can only deduce that a locomotive-hauled Pullman train will be impeded by some 40 tons of excess weight, for the doubtful advantage of being fitted with inferior bogies. I wonder why?

Yours faithfully,

JOHN RODGERS

132, Worrin Road,  
Shenfield, Essex

### Signalling at Junctions

October 31

SIR,—Reference the letter in your October 28 issue from Mr. F. Clifton Sheriff, my information is that the effects of Rule 39a are produced in multi-aspect signalling areas automatically in this manner:—

The signal immediately in rear of the controlled signal protecting the fouling point at a converging junction, which would under normal automatic control exhibit a yellow aspect, is maintained at red until its berth track circuit becomes occupied, when it will exhibit a single yellow. The length of the berth track circuit is so adjusted as to ensure that a train approaching this signal will be moving slowly before the signal clears to a single yellow. This point is, in fact, brought out in the article on the Birmingham Snow Hill installation in the current issue.

This "delayed yellow" procedure would seem to be an essential requirement in areas using three-aspect signals because there the period of warning which a driver gets is less than with four-aspect signals. Even if the signal immediately in rear of that protecting the converging fouling point is a controlled signal, the "delayed yellow" procedure can still be applied.

Yours faithfully,

ROBERT W. MCCALL

Marston, 20, South Eden Park Road,  
Beckenham, Kent.

### Public Impressions of the Railways

October 25

SIR,—I refer to the editorial article in your October 21 issue on the Presidential Address by Mr. J. R. Hammond to the Railway Students' Association, on the general picture, or "image" of railways in the public mind. I believe that many present problems spring directly from a false and unfair image formed during the last war, when many young people used railways extensively, often against their will and in uncomfortable circumstances.

It is unfortunate that politics bedevil the popular image of the railways. Some months ago I read of a Chamber of Commerce rejecting a motion to encourage greater use of railways for members' goods because this would be supporting a nationalised industry. As the ownership of such an industry is, by implication, vested in ourselves this argument is absurd.

Two distinct images exist in the public picture of railways as carriers of goods and as carriers of passengers. Published results show that both images gradually grow healthier. If the excellent safety record had greater publicity they would

improve more quickly. The time is ripe for a third image of our railways as a means of developing tourist traffic, of which there is an immense potential, among visitors from abroad and the many people in Britain who are given holidays with pay. The informed tourist learns that our railways are priceless national possessions, with a history that has given them a mature place in the landscape. His image is a synthesis of railway history and feeling for scenery.

A special contribution to the public impression of railways comes from the enthusiast, with his literature, models, societies and exhibitions. He has a unique image of railways, loyal and largely less critical, but it tends to be damaged most by the withdrawal of train services. Unfortunately, enthusiasts tend to isolate themselves from the general public. Cultivation of the rail-tourist's image could go far to bridge this gap.

Yours faithfully,

WILLIAM B. STOCKS

22, Heatherfield Road,  
Marsh, Huddersfield

### The Term "Railway Officer"

November 4

SIR,—The term "railway officer" is not of comparatively recent origin, as Mr. H. F. Dalton suggests in his letter published in your November 4 issue. It is used in the Regulation of Railways Act, 1840, and in other early railway statutes. In the archives of the Stockton & Darlington Railway there are references to a "Superintendent and his Privates." There was, inevitably, an importation of Waterloo veterans into the railway service at this time.

Yours faithfully,

W. O. GAY

15, West Heath Road,  
London, N.W.3

### Multiple-Unit Trains

November 5

SIR,—The policy of British Railways as regards the design of diesel and electric multiple-unit trains seems to me amazing. For several years large numbers of sets were built in which whole rows of passengers must sit facing the wrong direction. This was bad enough, but now a design has been chosen which combines all the worst features of compartment stock with the disadvantages of open carriages.

The new diesel sets recently placed in service on the Liverpool to Manchester line of the former Cheshire Lines Committee, now in the London Midland Region, are an example. These have large windows, but the seats are so placed that no passenger obtains any advantage from them. There are doors in every section, quite unnecessary on an express service like this, and the old-fashioned windows are such that if a passenger in one section opens a window fairly wide the occupants of all adjoining sections are in a violent draught.

There is no communication between coaches, or even between different sections of the same coach, except in one coach per four-coach set. Toilets are provided for first class and for non-smoking second class passengers, but for nobody else.

Yours faithfully,

NORMAN N. FORBES

39, Oakdale Road,  
Liverpool, 22

## THE SCRAP HEAP

### An American View of Piggyback Transport

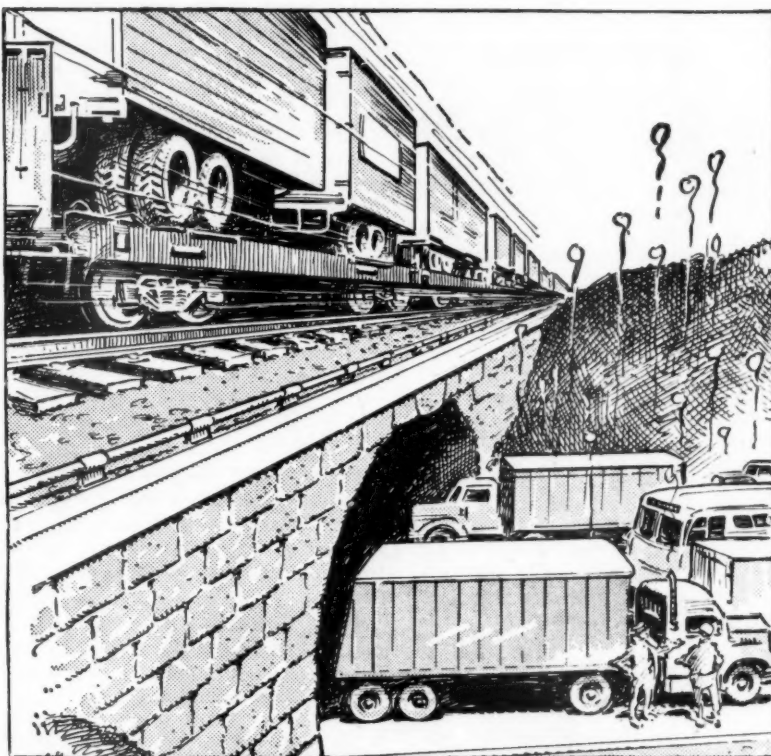
The advantages of piggyback transport are well depicted in the cartoon from the *Brotherhood of Locomotive Firemen & Enginemen Magazine*. It would be interesting to know whether they have been emphasised by cartoons and other means in the American daily newspapers.

### "Starved Horse Can't Keep up the Pace"

No industry is in so tight a strait-jacket as the railroads. The unions demand the continuation, apparently for ever, of many work rules which are 30 or more years old and are entirely inconsistent with present-day operation. The Federal government, despite some relatively minor reforms brought about by the Transportation Act of 1958, still regulates the industry in the light of conditions that have vanished for ever. So do States. And the railroads' aggressive competitors are given preferred treatment all along the line. No one can say the railroads aren't doing their best. Since World War II, they've spent \$15 billion for new plant and equipment. . . . But a starved horse, iron or other, can't keep up the pace.—From the "San Francisco Daily Commercial News."

### "Wondrous Fine Station"

Manchester Piccadilly, as the former London Road Station is now known after re-building in connection with electrification of the Crewe-Manchester line of the London Midland Region, has received a tribute from the Labuan Railways, in British North Borneo. A letter addressed by the Honorary Secretary of Labuan Railways Incorporated to the Most Honorable Stationmaster, Piccadilly Station, Manchester, reads: "I am writing to you from the instructions of my Managing Director . . . to



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[The Brotherhood of Locomotive Firemen & Enginemen

*Piggyback transport in the U.S.A.: note size of trailers on wagons*

convey to you his felicitations and pleasure at seeing the wondrous fine station of Manchester Piccadilly. One of our directors who has seen the *Manchester Evening News* showed the Board the pictures of this most wonderful

edifice, and will [show] our architect these photographs when he is to build us a much smaller terminal in Victoria Town."

### Linguistic Complications

Making Malay the sole official language of the Federation is proving to be a serious business . . . Technical terms have arisen piecemeal . . . The express from Singapore to Kuala Lumpur is "the haughty fire carriage" in Malay, because it goes right through without stopping to exchange civilities.—John Calver, "The Daily Telegraph."

### Steam Working in Czechoslovakia

The 4-8-2 locomotive of the Czechoslovak State Railways shown in the illustration is one of a two-cylinder mixed-traffic class, of which about 150 were built by the Skoda Works. They are fitted with mechanical stokers and double Kylchap exhaust.

### Railroad Pay Cars

An old tradition ends. For 90 years railroad pay cars rolled over North America, but only in daytime guarded by six-guns. The final "money wagon" was on the Canadian Pacific train 518, "The Scot" which crossed Maine between St. John, New Brunswick, and Lac Megantic, Quebec, making all stops en route to pay C.P.R. employees. It began running in 1914, and ceased on July 5.—From "Railroad Magazine."



Photo]

[A. E. Durrant

*Express goods train near Bratislava, Czechoslovak State Railways, hauled by a 4-8-2 mixed-traffic locomotive*

## OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

### SOUTH AFRICA

#### New Rolling Stock

During August, 1960, the South African Railways placed eight diesel-electric and seven class "5E1" electric locomotives in service, as well as 20 officials' coaches, 517 goods wagons of various classes, and nine steam heating tenders for winter heating of electrically hauled trains.

### VICTORIA

#### Grade Separation Scheme

The £375,000 grade separation scheme at Glenhuntly Road, Elsternwick, was recently completed. The project that began in February, 1959, provided for the lowering of the main Sandringham lines by about 18 ft. with the provision of an island platform. New station buildings, close to street level, are being built. Lowering of the tracks over about half-a-mile necessitated the construction of temporary main lines, and platforms and station buildings on the western side of the old station. The temporary tracks were brought into use in August, 1959.

#### Out-of-gauge Load

The heaviest single load ever to be carried by the Victorian Railways left Melbourne on October 16. This was a stator weighing 116 tons which had arrived by sea from England, consigned to the State Electricity Commission at Yallourn. The stator was unloaded on to a special 12-axle articulated 150 ton capacity railway well wagon, designed

and built by the Victorian Railways at Newport Workshops. The loaded wagon was hauled as an out-of-gauge load by special train from Melbourne Yard to Yallourn power station (approximately 89 miles) subject to a maximum speed of 15 m.p.h. with further reduction to 5 m.p.h. over the numerous open level crossings en route. Because of the 14 ft. 9 in. height of the load exceeding the normal loading gauge of 14 ft. there was at various locations bare minimum clearance under overhead contact wires. The current was switched off, and electric traction was, therefore, not possible. The special was worked by a T-class Bo-Bo 875-h.p. diesel-electric locomotive, and the trip took something over 10 hr.

#### Spencer Street Station Remodelling

In the past month work has begun in earnest on the re-arrangement of tracks and removal of redundant overhead electric contact wires and supporting structures in the vicinity of Spencer Street Station, where work is soon to commence on re-arrangement of platforms and building a new entrance and modern facilities fronting Spencer Street, opposite Little Collins Street.

Under the proposed re-arrangement to provide facilities for terminating the standard-gauge trains, existing isolated terminal platforms Nos. 9, 10 and 10A (opposite Bourke Street) will be demolished and on the alignment of what is now No. 9, extended across the present car parking area, will be a new platform for standard-gauge trains. The existing platform 1 (the present arrival and departure point for inter-state traffic

to New South Wales and South Australia) will be provided with extra rails to accommodate both broad- and standard-gauge trains, to cope with peak traffic and emergencies.

Other works contemplated include provision of at least one new island platform for terminating trains, building a new rail motor depot, completion of the existing suburban passenger subway to a new exit in the new building fronting Spencer Street, near Little Collins Street, and demolition of the existing buildings fronting Spencer Street.

### NEW SOUTH WALES

#### Diesel Railcar Services

The eventual conversion of all suburban rail services in the Newcastle area to diesel railcar operation is being planned by the Government Railways Traffic Branch. Two two-car diesel trains of the 600/700 class have been converted for this purpose and they will enter service with the introduction of the 1960-61 timetable this month. Five additional two-car trains will be constructed at the Chullora Shops and these will be integrated into the new timetables as they are completed. Modifications to the existing cars for suburban operation include installation of second class seating in both compartments of the trailer car and conversion of the van section of the power car into a passenger compartment.

### NEW ZEALAND

#### Diesel-electric Locomotives

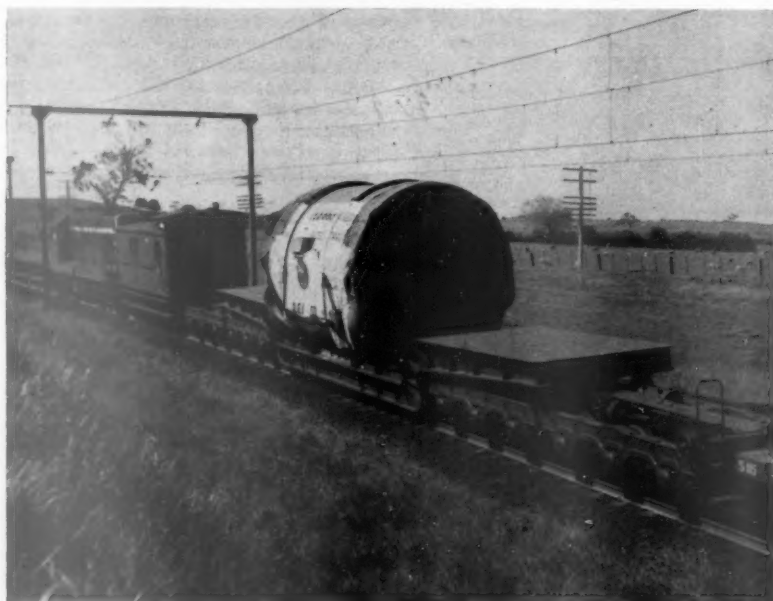
The Government Railways has accepted a tender of £840,000 by General Motors Diesel Limited, Canada, for the manufacture of 12 diesel-electric locomotives similar in type to the "DA" Class 1,425-h.p. main-line locomotives now in service in the North Island. The Canadian company, in submitting the lowest tender, has offered a fixed price without any "rise and fall" provisions, and with the delivery of all 12 locomotives assured within eight months. The additional locomotives are required for freight haulage on the Napier and New Plymouth lines and some will augment the diesels in use on the main trunk route and so allow the Limited passenger expresses, being diesel, to keep to a faster timetable.

The new diesel locomotives will replace some of the oil-burning "K" Class steam locomotives, now 30 years old, which are expensive to run and are becoming increasingly costly to overhaul.

### INDIA

#### Oil Pipe Line Rejected

The Deputy Minister of Railways, Mr. Shah Nawaz Khan, confirmed in Parliament recently that the Railway Board had rejected the request of the Assam



Photo]

[J. L. Buckland

A 116-ton alternator stator being carried on a special 150-ton well wagon on Victorian Railways



Oil Company to take a crude oil pipe line of the Oil India Limited over the new Brahmaputra Bridge now under construction. He said it was not considered safe to lay the pipe line over this important rail and road bridge.

#### Structural Steel from Scrap

The Matunga Workshop of the Central Railway has recently undertaken the fabrication, as an experiment, of 25 tons of structural steel by using scrap from condemned wagons.

#### New Marshalling Yards

Sanction has been granted for constructing a new marshalling yard at Virudhunagar, on the Southern Railway. The new yard is estimated to cost Rs. 27 lakhs. The railway yard at Tinsukia on the North East Frontier Railway in Assam, is to be remodelled at a cost of Rs. 40 lakhs.

### CZECHOSLOVAKIA

#### Prague Traffic Reorganisation

The Government has approved a project for re-organisation of traffic in and around Prague, to be completed in 1961-65. The scheme provides for all passenger traffic to be dealt with at one central station, and for concentration of goods traffic. The Tesnov passenger terminus

is to be closed, and one of the other two termini is to lose much of its traffic. North-to-south traffic routed by a new line, will be served by the existing Main Station, which is to be re-built in stages to form a Central Station. Work on electrification in the Prague area is to be accelerated.

### WESTERN GERMANY

#### Colour Code

The German Federal Railway is to paint all electric locomotives capable of speeds over 75 m.p.h. blue, electric shunting locomotives are to be red, and all other electric locomotives green. Diesel locomotives and railcars are to be painted red, while steam locomotives are to remain black except for the undercarriage and wheels, which will be painted red.

#### New Underground Line

On October 1, the Hamburg Elevated Railway brought into use the section of new underground line from Messberg via Steinstrasse to new low-level platforms at the Hauptbahnhof. Just over a mile of the projected Jungfernstieg-Wandsbek line is therefore now in use, and the next section, from the Hauptbahnhof to Lübeckerstrasse, is scheduled for completion in the autumn of 1961.

The newly-opened section includes Hamburg's first example of construction in twin-tube tunnels.

### SWEDEN

#### Electric Suburban Service

The electric suburban trains of the State-owned Djursholm Railway no longer run through the streets of Stockholm to the city centre terminus at Engelbrektsplan. All trains now terminate at Stockholm East Station, and passengers must complete their journey into the city by tram. The first section of the narrow-gauge Djursholm Railway was electrified by Mather & Platt in 1895, a pioneer example in Europe of suburban electrification.

### U.S.S.R.

#### Kiev Underground Railway

The Kiev underground railway, the third in the U.S.S.R., after Moscow and Leningrad, went into operation on October 22 when services started on the first line, nearly four miles long, linking four districts of the city. All six stations of the new line were designed by Ukrainian architects and decorated with white and rose marble, coloured granite and Ukrainian majolica.

### Publications Received

*More Unusual Railways.* By John R. Day. London: Frederick Muller Limited, 110, Fleet Street, E.C.4. 8½ in. × 5½ in. 214 pp. Illustrated. Price, 21s. —Monorails, to connect airports with city centres, and moving platforms, exemplified in the Travolator at the Bank station of the Waterloo & City line, British Railways, Southern Region, have been much discussed recently. For that reason the chapters on monorails and on moving platforms in this sequel to the same author's "Unusual Railways," reviewed briefly in our February 21, 1958, issue, are of considerable documentary value. Other chapters deal with the Talgo and similar systems of articulated trains; railways on gradients; guide-rail systems; lines worked with horse-drawn and sail-propelled vehicles; conveyance at the Guinness brewery in Dublin of narrow-gauge locomotives on 5-ft. 3-in. gauge wagons, and many other forms of rail transport. The descriptions are clearly written and the illustrations, which include diagrams well chosen.

*Glasgow Electric.* By George Blake. Issued by British Railways, Scottish Region, to mark completion of the first phase of 50-cycle electrification of suburban lines, this handsomely produced and illustrated souvenir publication is an admirable survey of the scheme, the problems faced, and their solution in the work already completed and in plans for further conversion. The descriptions are clear and concise, and in a style rightly calculated to appeal to all readers, technical or otherwise.

Enough historical background, such as the references to the building of lines by rival railway companies and to the Inglis Report of 1951 on Glasgow traffic problems, is given to elucidate the new schemes. The typography adds much to the pleasure of reading. The illustrations, both in colour and monochrome, are excellent. The front cover is a reproduction in colour of a painting by Terence Cuneo of one of the new electric trains, built by the Pressed Steel Co. Ltd., with A.E.I. Limited equipment, on the bank of the Clyde. A clear sketch map, also in colour, shows the routes on which electric services were inaugurated last Saturday and those where they will start in 1961. Rolling stock, signalling and telecommunications, electric power supply, and new stations and other civil engineering works are shown in a series of photographic illustrations, many in colour.

*Co-operation between Industry and Education.*—London: The Industrial Training Council, 36, Smith Square, S.W.1. Price, 3s.—In this 63-page booklet the Industrial Training Council describes the arrangements in some 40 industries, including iron and steel, for co-operation between those industries and educational bodies at national, regional, and local levels in the further education and training of workpeople up to the craft level. A general description of the machinery, industrial and educational, for co-operation at various levels, is followed by accounts, for some selected industries, of the ways in which co-operation takes place at various levels in those industries, and, in some cases, of the results achieved.

The effectiveness of the local machinery is illustrated by some 30 examples from 20 industries.

*Credé Rolling Stock.*—The passenger coaches, railcars and special types of freight wagons for several countries built during the last few years by Getr. Credé & Co., G.m.b.H., of Kassel-Niederzwehren, Germany, are illustrated and described in a new spiral-bound volume, "Railway Vehicles," which forms a more or less complete catalogue of current production in this field. 86-ft. passenger coaches, railcars and railcar-trains up to 1,000 b.h.p., six-axle trolley wagons, and self-propelled (diesel) mineral tipping wagons are among the stock described. The catalogue was issued originally in Germany, and the English edition has just been published.

*Webasto Heating.*—A six-page folder with text in English gives a concise yet complete description of the passenger carriage and railcar heating equipment made by Webasto-Werk G.m.b.H., at (13b) Stockdorf bei München, Germany. A coloured sectional view and tabulated particulars of five basic models are included. An edition with German text also is available.

*M.A.N. Stock.*—A series of single leaflets in four colours has been made up into a book, "M.A.N. Waggonbau," to show a selection of the most modern diesel railcars and trains, electric multiple-unit trains, battery railcars, and passenger coaches made by M.A.N. at its Nuremberg works, in Germany.

## Diesel Maintenance in the Western Region

*Three different types of depot for maintenance or servicing of diesel units at Plymouth, Reading, and Westbury*



*Reading railcar maintenance under construction; view from stop block, showing detail of roof and inspection pits*

THE major part of the work of converting the Western Region, British Railways, from steam to diesel traction as part of the British Transport Commission's modernisation plan falls broadly into two parts; first, substitution of steam by diesel locomotives; and, second, replacement of steam locomotives and coaching stock by diesel multiple-unit trains.

### Two Groups of Facilities

Maintenance and daily servicing of the new form of power have necessitated provision of depots to undertake the work in all parts of the Region. The facilities to be provided fall into two main categories: those required for periodical maintenance and those required for fuelling and daily servicing. The plan envisages a number of large maintenance depots sited in almost every case at main centres of railway working.

Within the orbit of each large maintenance depot are usually several fuelling and servicing depots at which the diesel locomotives or multiple units are attended to on a daily basis proceeding only occasionally to the central maintenance depot for periodical attention in accordance with a pre-planned maintenance cycle.

This article describes three developments which have taken place already at three points on the Region towards the achievement of the final plan of depot coverage.

At Plymouth a major maintenance depot is being provided as a parent maintenance depot for all diesel locomotives and multiple units based on the Western Region in Cornwall and at Plymouth itself. Servicing and fuelling

facilities are also provided for diesel locomotives at the depot; fuelling and servicing arrangements for multiple units in the Plymouth area in this instance are at the Belmont Carriage Sidings just South of Plymouth North Road Station. These facilities have not been concentrated on Laira, the site of the main depot, because of the desirability of stabling and cleaning of coaching stock vehicles including the multiple units, nearer to the passenger station.

At Westbury (Wilts) a daily servicing and fuelling point for diesel multiple units has been provided as a first stage in the conversion of the facilities for com-

prehensive diesel working. Later on provision for diesel locomotives will be made at this point. The multiple unit servicing facilities fall within the main Bristol area at which point the central maintenance depot is sited.

### Reading Depot for Multiple Units

At Reading, a joint maintenance, fuelling, and servicing depot for diesel multiple units has been established as a first stage. Later, fuelling and servicing facilities for diesel locomotives will be provided there. The multiple units based at Reading cover most of the inner and outer suburban services of the Western Region London Division and sets based at Reading work, broadly, between Paddington and Oxford and intermediate points, also on certain other workings on the Newbury and Basingstoke lines.

The whole of the facilities are sited in the triangle of railway-owned land which stands at the west end of the station. The maintenance depot, as a result of geographical circumstances, being sited at a lower level with the servicing and fuelling facilities and carriage sidings, where cleaning is carried out, being sited at a higher level.

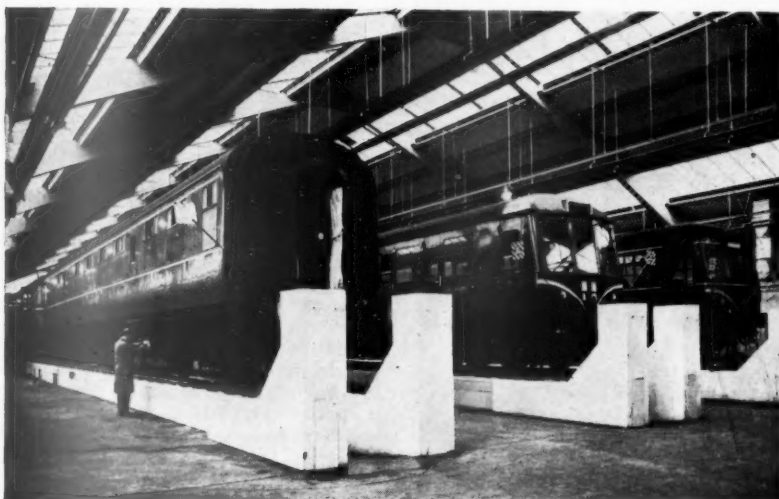
The present overall position for diesel depots in the Western Region is:—

Large depots	... completed	...	5
	under construction	...	3
	authorised but not yet	...	2
Medium-size depots	... completed	...	4
	under construction	...	1
	authorised but not yet	...	1
Small depots	... completed	...	22
	under construction	...	2
	authorised but not yet	...	1
	under construction	...	41

Facilities are provided at railcar depot at Reading for the maintenance



*Pit lighting and ventilation shafts in Reading depot: offices, workshops, and specialised service facilities are in annexe in background*



*Raised tracks in Reading depot afford easy access to vehicles: note the solid design of stop blocks*

and day-to-day servicing and inspection of diesel railcars. The maintenance shed has a pre-cast pre-stressed concrete frame of the pitched portal type, and the building is clad with protected metal sheeting pale green in colour with patent glazing roof lights and gable ends. Three 210-ft. inspection pits are provided with a depressed floor to permit the use of fork-lift trucks for engine changing to afford easy access to the underside of the vehicles.

#### **Annexe Building at Reading**

The workshops and specialised service facilities have been grouped with the offices and staff amenities in the one- and two-storey annexe buildings.

These have been constructed in a reinforced concrete framing, with glazed and vitreous enamel panelled curtain walling as external cladding. The boiler-house is of contemporary design with a completely glazed front elevation. Oil-fired boilers are installed and all the waste sump oil from the depot is used as fuel.

Central heating is provided in the office and amenities block, and radiant strip heating in the maintenance shed. Air conditioning with variable temperature control allows for regular air changes and removal of exhaust fumes from the main shed.

#### **Inspection and Fuelling**

Some distance from the main depot at a higher level lie the fuelling and inspection facilities, consisting of a 210-ft. covered inspection pit, with fuelling points.

Adjacent to this is situated the stores, workshop and staff amenities building which provides messing and toilet accommodation in addition to its more functional uses.

The bulk fuel storage facilities at the Reading installation consist of two cylindrical tanks each of 12,000 gal. capacity within a solidly constructed protective bund.

Because of the poor bearing capabilities of the ground it was found necessary to

use piles beneath the foundations of the main buildings of the depot at Reading and below all vehicle inspection and maintenance pits.

#### **Locomotive Maintenance at Plymouth**

The principal buildings in the maintenance depot at Plymouth Laira are the diesel locomotive maintenance, cleaning, and servicing sheds, and the diesel railcar shed. All these buildings are reinforced concrete framed and have barrel vault roofs. Much use has been made of patent glazing in the external walls to give optimum day lighting.

Internally three 210-ft. inspection pits are provided for maintenance of diesel railcars, two 280-ft. pits with high-level platforms for the maintenance of diesel locomotives.

For the cleaning and servicing of the diesel locomotives three 140-ft. pits have been constructed and facilities are available for bogie changing and

wheel re-profiling. The general workshop and other specialised services connected with diesel engines are grouped with the offices of the supervisory staff.

Offices and general staff amenities are provided up to a high standard in the two-storey office and amenities block. This building is of flat roofed reinforced concrete framed construction, with external cladding to match the main buildings.

At the fuelling and sanding points, glazed reinforced concrete shelters have been provided to afford protection to both staff and vehicles during these operations.

Fuel-oil-fired heating boilers burning waste sump oil from the diesel locomotives, have been provided within the offices and amenities block, and radiant strip heating in the main sheds. The fuel storage depot allows for the storage in bulk of 45,000 gal. of diesel oil, in three vertical tanks. The main buildings and the bulk fuel oil tanks are founded on piles as the site is wholly on made ground of relatively low bearing capacity.

#### **Westbury Depot for Multiple Units**

The function of the depot at Westbury is to provide for the day-to-day inspection, servicing and fuelling of diesel multiple units. Two 70-ft. fuelling pits are provided with glazed open-ended shelters.

A two-storey stores, workshop and amenities building is provided adjacent to the fuelling shelters.

The building is of precast reinforced concrete pitched portal framing with non-structural brick paved walls, in the design. Oil-fired central heating is provided and to avoid the necessity of having two types of fuel oil, this boiler is adapted to burn diesel fuel oil as provided for the vehicles.

The buildings are sited over old mine workings, but after thorough examination of the site and adequate filling and consolidation it was found possible to construct without recourse to piling.

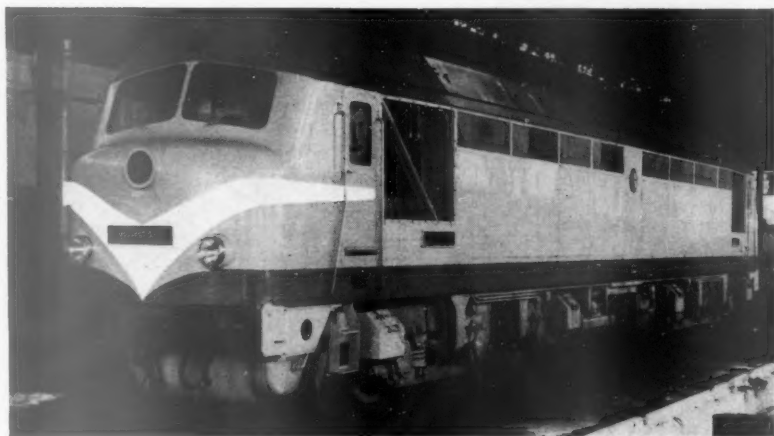


*Re-fuelling installation in depot at Westbury to serve multiple-unit trains as first stage. Provision for diesel locomotives will be made later*



## Gas-Generator Main-Line Locomotives

*Further French development using twin power plants and two-speed mechanical transmission*



*Completed locomotive in the Achères depot of the S.N.C.F.*

**W**ITHIN the last few weeks running has begun on the French National Railways of two large gas-generator locomotives of C-C axle notation and 120 tons weight. Built by the Régie National des Usines Renault and the Ateliers et Forges de la Loire, these units are a development from the 1,100 h.p. B-B gas-generator locomotive built in 1952, and which has now completed about a quarter of a million miles. Modifications to this early locomotive have raised its gas h.p. to 1,200, and the new machines have two power plants of the same general type, thus giving a gas h.p. of 2,400.

The h.p. rating of the locomotive, however, is on a more complicated basis; at the turbine output shaft each power group has a rating of 1,130 h.p., or 2,260 h.p. total, and this corresponds more or less to the b.h.p. of a normal diesel locomotive; but an auxiliary diesel group of 276 b.h.p. is also carried, so that the total installed output is 2,536 h.p. It is more convenient to consider this locomotive simply as of 2,500 h.p. for comparative purposes.

### Principles

Constructionally a gas-generator locomotive comprises essentially a gas-producer, an exhaust-gas turbine, and a transmission. The gas-generator is in the form of a diesel engine whose sole function is to produce gas. This gas, mixed with air if necessary to reduce its temperature, is then passed to the exhaust gas turbine, which drives the transmission. The torque-speed characteristics of such a turbine being somewhat more favourable for traction work than that of a normal diesel engine, the transmission can be simplified, and in these two new large locomotives is of the mechanical two-speed type.

Any type of diesel engine can be used as a gas-producer. In these locomotives the Pescara free-piston engine has been used because as a gas-producer it tends

to be more efficient and more flexible than a normal diesel and can provide conveniently any air needed to reduce the gas temperature before entry to the turbine, though this may not be needed, according to the fuel-burning rate and the fuel: air ratio. From the generator the exhaust goes first into a hot-gas equalising reservoir to give some equalisation of pressure from the exhaust pulses, and under full load the pressure in this reservoir is about 50 lb. per sq. in., the gas temperature about 470°C. and the flow from reservoir to turbine equal to about 8.5 lb. of gas per sec.

### Layout of Equipment

In general layout the locomotive design is symmetrical about the centre line, with a driving cab at each end. Between the centre line and each driving-cab bulkhead is a gas-generator plant complete with air-intake and filtering system, cooling group, the hot-gas reservoir, and the turbine. At the centre of the locomotive, at under-frame level, is a common gearbox casing housing two complete sets of change-speed and reversing gears, one for each turbine; and the output from each set of gears goes by cardan-shaft line to the three axles of one bogie. Asymmetrical details are the auxiliaries, such as the 276 b.h.p. diesel generator set, high-pressure and low-pressure compressors, starting air bottles, the water, oil and fuel pumps, and the filters, the arrangement of which has been made to give approximately equal balance and axle loading at each end of the locomotive.

### Speed and Tractive Effort

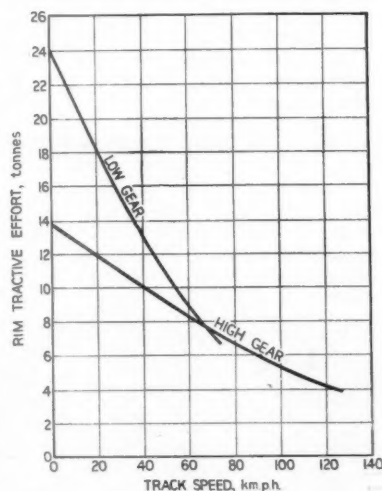
Speed-tractive effort characteristics of one of these 2,500-h.p. gas-generator locomotives are shown in an accompanying graph, from which will be appreciated the comparatively low starting tractive effort provided for a 120-ton locomotive, viz. 53,000 lb., though this should be enough for most duties. Study

of these curves shows that in the normal running speed range 1,850 to 1,925 h.p. are available at the wheel rims. An advantage of the gas-generator locomotive with mechanical transmission is that it has no time-based rating; any tractive effort which can be developed can be maintained indefinitely without heating anything.

Only two speed steps are provided, and the change-over point is nominally 40 m.p.h. For each set of gears a main clutch is interposed between turbine and change-speed gears, but located on the outside of the gearbox casing. Either an electro-magnetic clutch or friction clutch can be adopted, and an electro-magnetic shaft brake is included to give synchronisation during gear changes. A preliminary set of simple spur reduction gears is attached at the turbine output, giving an immediate 6.14:1 reduction of the turbine rotor speed, which is about 12,250 r.p.m. as a maximum, though that value is well above what corresponds to the maximum track speed of 77 m.p.h.

### Mechanical Portion

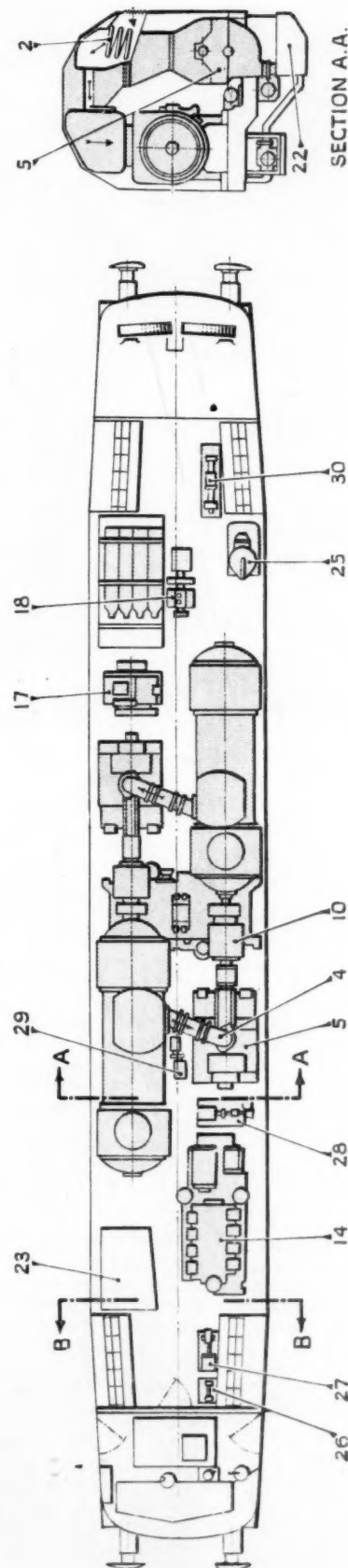
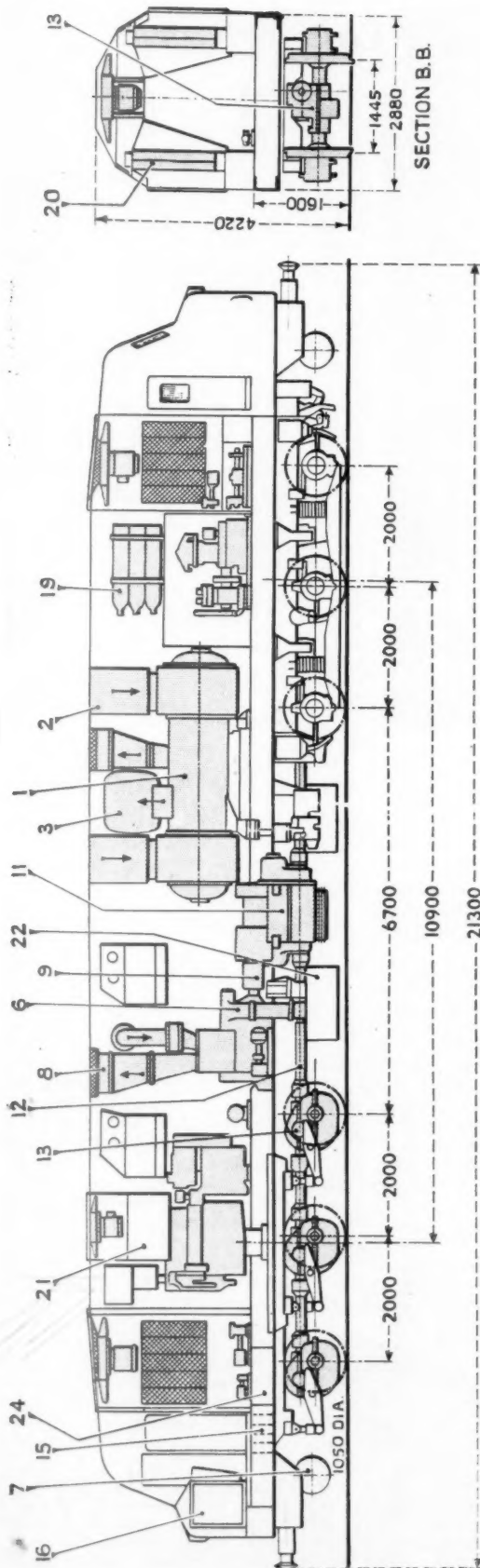
In the mechanical portion construction conventional principles have been followed, with a stiff underframe having two deep outside main longitudinals, no inner



*Speed-tractive effort curve, at wheel rims, with full controller notch, of 2,400-h.p. gas generator locomotive*

longitudinals, and numerous deep transverse members which carry directly the weight of the power-transmission equipment. Superstructure side frames are of girder form with stiff diagonal tracing topped by a large hollow cantilever section. Substantial steel-plate dragboxes are welded into the under frame, which in itself is fully welded, as are the side frames. The roof is made up of a sandwich form of hard insulating material, and does not take stress.

(Continued on page 568)

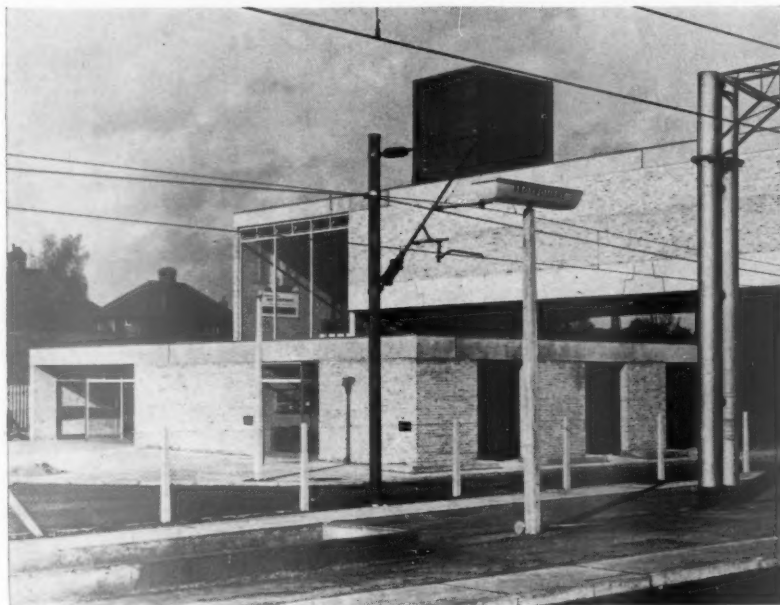


- |                                      |  |   |                                       |                           |
|--------------------------------------|--|---|---------------------------------------|---------------------------|
| 1—Gas generator                      | 7—Air-brake reservoirs                                     | 11—Gearbox housing reverse idler and alternator speed gears | 17—Air-brake and services             | 23—Fuel tank              |
| 2—Intake air filter                  | 8—Turbine exhaust outlet ducts                             | 12—Primary cardan-shaft line                                | 18—High-pressure compressor           | 24—Tank for gas-oil       |
| 3—Hot exhaust gas equalising chamber | 9—Glænzer flexible coupling                                | 13—Axle drive   | 19—High - pressure air bottles        | 25—Fuel cleaner           |
| 4—Exhaust gas pipes to turbine       | 10—Main clutch and shaft brake between turbine and gearbox | 14—Auxiliary diesel - generator set                         | 20—Cooling groups                     | 26—Gas-oil transfer pump  |
| 5—Exhaust-gas turbine                |  | 15—Storage battery  | 21—Cooling group for auxiliary engine | 27—Fuel oil transfer pump |
| 6—Turbine primary reduction gears    |  | 16—Electrical equipment                                     | 22—Tank for turbine lubricating oil   | 28—Water circulating pump |
|                                      |  |   |                                       | 29—Oil pump               |
|                                      |  |   |                                       | 30—Fuel circulating pump  |

*Layout of equipment in twin power-plant C-C gas-generator locomotive with mechanical transmission, Class "060.GA," French National Railways*

## Broxbourne & Hoddesdon Station, Eastern Region

*In addition to removing a long-standing rail bottleneck this new station provides special facilities for road users*



*Entrance and staircase block with Down platform in foreground*

**O**FFICIALLY opened on November 3, the new Great Eastern Line station, Broxbourne & Hoddesdon, is 17 miles from London, and the junction for Hertford East trains. Its construction was the principal feature of a major modernisation scheme in the area. This also included extensive track alterations, the construction of a new signalbox, a technical services building, and the provision of a well-equipped goods and coal yard. The centre span of nearby Nazeing Road bridge had to be raised to give sufficient clearance for the high-voltage overhead electrification.

The station is 100 yd. north of the former 70-year-old building now demolished. Like Harlow Town Station, which was opened about four months ago, it possesses striking features in three 50-ft.-high towers, housing the parcels lifts, and a lofty glazed staircase hall. An impressive modern entrance fronts on a new approach road and forecourt, which has parking space for more than 80 cars, a taxi rank, and a bus terminal point. A single-storey block at forecourt level accommodates the booking hall, fully-mechanised ticket office, and the enquiry, left luggage, and parcels offices. Undercover storage for 50 bicycles also is provided.

### Two Corridors in Bridge

The bridge linking booking hall and platforms has two separate corridors—one for passengers and the other, served by lifts, for parcels traffic. It also accommodates the stationmaster's office with its one-way vision glass screen, a

newsagent's kiosk, toilet facilities, and a public waiting room equipped with furniture specially designed for the Eastern Region. A feature of the waiting room is the photo-mural decoration, reproducing a print showing the opening of the Eastern Union Railway in June, 1848.

The awnings over the centres of the two island platforms consist of a grid of lightweight trussed steel beams, bearing on brick cross piers. The roof covering is of bituminous felt on wood-wool slabs with timber soffits and fascias. Services for loudspeakers, lighting, and drainage are concealed in the cavities of the awning and supporting walls.

Beyond the covered part of the platforms are enclosed waiting shelters—three on the Up platform and two on the Down.

### Brick-faced Concrete Lift Towers

The main structure has been designed so that the whole of the overbridge is supported by the three lift towers and an intermediate fin. The lift shafts are of reinforced *in situ* cast concrete faced in blue brindle brickwork used as permanent shuttering, from which are cantilevered parts of the overbridge floor. On these cantilevers are supported precast pre-stressed concrete beams and floor slabs which span over the railway running tracks and access road. The structural floor of each span was designed to be erected in a few hours to minimise disturbance of railway operation. The superstructure of the overbridge is of London stock brickwork used as simply

as possible with a lightweight roof system, again of trussed steel beams, designed to give lateral stability to the supporting brickwork.

Public areas have blue quarry-tiled floors, fair-faced brick walls, and hardwood ceilings. Paintwork has been kept to a minimum. Contrasting materials have been used deliberately. The rough texture of brick surfaces and the giant concrete superstructure are set against large sheets of plate glass and the smoothness and precision of timber handrails and aluminium door furniture.

### Engineering Staff Accommodation

A small building adjacent to the goods yard houses workshops, offices, and messing facilities for the staffs of the District Engineer, District Outdoor Machinery Engineer, and Signal Engineer. This replaces the accommodation formerly occupied in the old station buildings.

Lighting is provided by cold cathode fluorescent tubes, each fitting on the platforms bearing the name of the station.

In the ticket office and booking hall and on the bridge, fluorescent tubes have been fitted in roof openings to provide both artificial and natural light from the same source. Plastic louvres, set flush with the ceiling boarding, maintain the smooth overall finish.

New lighting was provided in the station yard together with power supply for the three lifts amounting to an electrical load in the region of 70 kVA.

The ticket office contains a Flexi-printer ticket printing, issuing, and accounting machine specially designed for the printing and issuing of tickets at small or medium-sized ticket offices. This machine can issue ordinary and season tickets. It records details of all issues in chronological order and maintains an aggregate debit which is constantly available. It is equipped with external print plates which are stored in racks adjacent to the machine. Because of this, the machine itself is only the size of a cash register. Basically, it is a small printer which is placed on a suitable stand next to the rack of external printing units. It consists of a cabinet enclosing a card magazine, totaliser record strip, and mechanism. The card magazine has vertical storage columns and may consist of seven ordinary ticket columns and one season column, or three ordinary and three season ticket columns, or four season columns and two Edmondson columns.

There are four tracks through the station: the two island platforms enable Hertford East and Bishops Stortford electric trains to be divided or combined on the outer loop lines, leaving the two centre tracks free for main-line expresses.



Each platform can accommodate eight-car trains but provision has been made for possible future extension to 12-car capacity.

The re-siting of the station also has avoided the expense of costly bridge works which would have been necessary to allow for a loop to be formed from the existing bay on the Down side of the old station.

#### Goods Facilities Increased

The goods and coal yard provides facilities to meet increased requirements. Goods traffic previously handled at Roydon and Rye House stations is now dealt with at Broxbourne & Hoddesdon. Provision also has been made for mechanical handling of coal traffic. Facilities are available for local seasonal traffic—particularly flowers and fruit—which normally goes by passenger train.

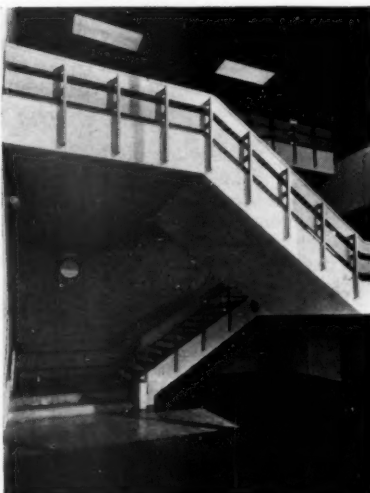
The power signalbox, which includes accommodation for signal engineering and operating staff, also provides accommodation for a telephone exchange shortly to be installed in connection with the modernisation of the Eastern Region telecommunications system. The box is situated on the up side of the line slightly to the north of the platforms.

The control desk is operated on the "entrance-exit" route-setting system. The panel face is inclined at approximately 15 deg. from the horizontal and measures 11 ft. in length x 1 ft. 9 in. in depth.

The track diagram extends from Wormley to Broxbourne Junction. Track-circuited sections are indicated in colour—orange and green being used, in general, for the down lines, and blue and yellow for the up lines.

The panel operates on the route system, operation being as described for Harlow Mill signalbox in our August 12 issue.

Above the operating panel and inclined at 15 deg. from the vertical, is a second panel 7½ in. in height which pro-



*Interior of entrance hall, showing main staircase leading to overbridge*

vides accommodation for telephone keys and for the selective calling signal post telephone display equipment. Two concentrations of telephone circuit keys are provided, one carrying ground-frame and motor-point telephone circuits for the exclusive use of the signalman and the other at the right-hand end of the console—where space is left for the train register book—which gives access to the local omnibus telephone circuits. The two keyboards are connected by a tie-line so that if required calls on an omnibus circuit can be taken by the signalman on his own handset.

#### Fire Protection

A comprehensive fire extinguishing system, employing carbon dioxide, has been installed covering the panel and relay room.

In the relay room under the operating



*Station name lamp standard containing cold-cathode fluorescent tubes*

floor, the relays are mounted on racks fixed at right-angles to the length of the building. A very large proportion of the relays are of the latest miniature pattern operating with 50-V. d.c.; included in these are the lock relays. All relays plug in to bases mounted on the racks and the connections to the coils and contacts consist of stranded wire terminated on clips which plug in to the relay bases.

Instead of the conventional tubular labels bearing circuit descriptions and contact numbers, small numbered identification sleeves are used on the wires, the numbers corresponding to the contact number to which connection is made. Where there are two wires on one contact one has an additional sleeve bearing an asterisk and this wire is identified on the wiring diagram by a corresponding asterisk.

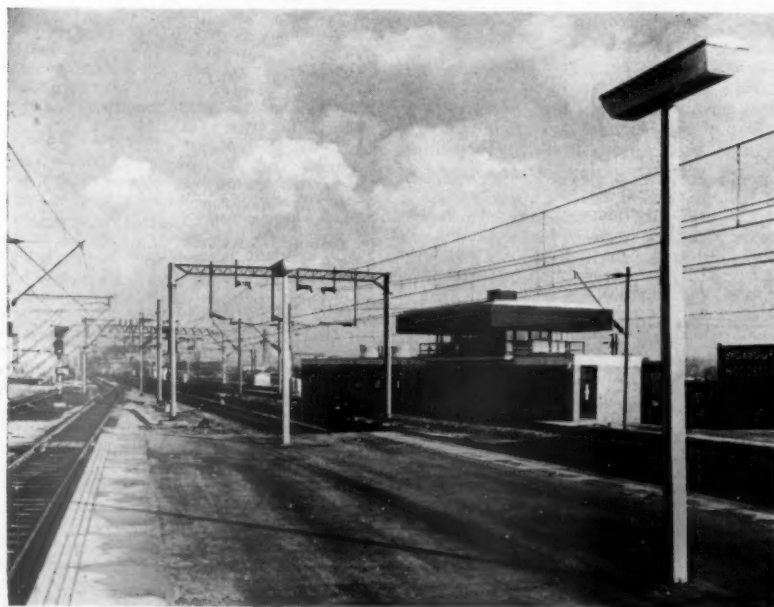
The cables used for circuits from outside locations to the terminal boards in the relay room and also between outside locations are of the rubber-insulated P.C.P.-sheath multi-core type.

Power for all the equipment at 650-V. 50 cycles is fed from local sources at Rye House traction feeder station about two miles distant. A standby supply is provided from the 25-kV. traction system, the changeover being effected automatically at Rye House should a mains failure occur.

#### Automatic Telephone Exchange

The section of the signalbox building provided for the telephone equipment will house an automatic exchange to which all telephone extensions in the environs of Broxbourne will be connected. This exchange will form a link in the scheme for modernising the telecommunications over the Eastern Region and will provide inter-dialling facilities between extensions, and between extensions and the remainder of the Regional network. The exchange will have provision for 100 extensions.

All aerial line wires have been abolished. Telecommunications circuits are carried in air-space aluminium-sheath cables laid in the same route as the signal-



*New signalbox at north end of station*

ling cables. The cable route consists essentially of ground-level concrete trough, cement-asbestos trough on posts being used where local conditions do not permit the installation of ground-level trough.

### Trackside Equipment

Steel apparatus cases with front and rear access mounted on concrete foundations are used at outside locations. These locations contain track-circuit feed units and track- and signal-control relays—all relays again being of the plug-in type. The equipment necessary for the control of the British Railways Standard Automatic Warning System is provided at each running signal location.

All main signals are of the searchlight type, a second yellow aspect and five-lamp junction indicators being added above the main unit where required. The searchlight mechanisms have plug connectors to facilitate changing. Position-light ground signals of the three-lamp type—some with stencil-type route indicators—are provided for shunting movements.

The bulbs in the searchlight signals are of the 12-V. 12/16-W. type, the main (12W.) filament being normally in use. Two lamp-proving relays are provided at each signal proving the main filament burning and the auxiliary filament intact. Contacts of these relays are connected in series with those of other signals on the same line to a lamp alarm indication on the control panel in the signalbox. Failure of the main filament causes the auxiliary filament to become illuminated and failure of either filament causes the alarm to be given in the signalbox. As long as one filament is burning, the signalling is unaffected but the alarm system allows

a defective bulb to be replaced before a signalling failure is caused.

The 29 point machines used on this scheme are of the 110-V. a.c. pattern and are controlled by a d.c. polar relay located at the machine.

All track circuits are of the d.c. rectifier-fed type and none is greater than 500 yd. in length. A special frequency discriminating relay (TFDR) is fitted at each track circuit feed location. This relay drops away and disconnects the track feed should an abnormally high 50-cycle voltage be produced across the rails or in case of power failure. In addition to this particular protective device associated with the track circuits, all equipment which could be subjected to interference from traction sources is immunised against 50-cycle voltages.

### Public Address System

A public address system has been installed on the platforms, the loudspeakers being built into the awnings. Plug points for a hand microphone are provided at strategic places along the platforms.

An impulse-operated electric clock system has been provided in the station and associated buildings. Eleven slave clocks are controlled from the master impulse unit, which is located in a small apparatus room on the footbridge.

The new station was designed by Mr. H. H. Powell, Regional Architect, and the work carried out under the general direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region.

The whole of the signalling and telecommunications work has been carried out under the direction of Mr. R. A. Green, Signal Engineer, Eastern Region.

The lighting installation was designed

by Mr. T. C. B. Miller, Chief Mechanical & Electrical Engineer, British Railways, Eastern Region.

Contractors were as follow:—

Station	
<b>Main contractors</b>	
W. & C. French Limited, Buckhurst Hill, Essex.	
<b>Sub-contractors</b>	
Heating (Station) ...	Matthew T. Hall & Co. Ltd.
Heating (Technical services building) ...	G. N. Haden & Son Ltd.
Electrical installation	Troughton & Young Limited
Supply and installation of lifts ...	Wm. Wadsworth & Co. Ltd.
Bituminous felt roofing	Limmer & Trinidad Lake Asphalt Co. Ltd.
Ironmongery ...	H. & C. Davis & Co. Ltd.
Metal windows	Doodson & Bain Limited
Metal folding doors, etc. ...	Hoskins (Metalwork)
Glazing ...	Mustill & Wallis & Co. Ltd.
Plumbing ...	Structural Services Limited
Roof steelwork ...	Metal Sections Limited
Ticket office furniture	Roneo Limited
"Flexiprinter" ticket-issuing machine ...	Westinghouse Garrard Ticket Machines Limited
Waiting room furniture	Hille (London) Limited
Cold cathode fittings	Ionlite Limited
Concrete lighting columns ...	Engineering & Lighting Equipment Co. Ltd.
<b>Civil Engineering Work</b>	
William Fairclough & Co. Ltd.	
<b>Piling</b>	
Holmpress Piles Limited	
<b>Signalbox</b>	
<b>General contractors</b>	
Hosking & Son (Essex) Ltd.	
<b>Sub-contractors</b>	
Heating ...	G. N. Haden & Sons Ltd.
Fire-fighting services ...	Walter Kidde Co. Ltd.
Precast roof units ...	Trussed Concrete Co. Ltd.
Framework to cabin	J. Jackson & Co. Ltd.
Metal windows	Doodson & Bain Limited
Thermoplastic wall & ceiling tiles	Semtex Limited
Rubber flooring	Semtex Limited
Sanitary goods	Standard Range Co. Ltd.
Wood block flooring	Hollis Flooring Limited
Duct covers ...	Broads Manufacturing Co. Ltd.
<b>Signalling apparatus contractors</b>	
Signalling equipment	Westinghouse Brake & Signal Co. Ltd.
Signal post telephones	Standard Telephones & Cables Limited
Electric clocks	Gent & Co. Ltd.
Telecommunications cabling ...	British Insulated Callender's Cables Limited
Loudspeaker system	Easco Electrical (Holdings) Limited
Telephone exchange	Associated Electrical Industries Limited

### Gas-Generator Main-Line Locomotives (Concluded from page 564)

The three-axle bogies are of compensated type, and each carries its share of the superstructure weight through four helical springs. The axleboxes are of Athertons type, connected to the frames through Alsthorn links with silentbloc bushings. The bogie pivot is mounted on rubber, but does not take any vertical load.

Four air-brake cylinders are carried on each bogie, and apply double-shoe blocks on each side of each wheel. Fuel carried totals 1,000 gal. for the gas-generator plant, housed in two tanks of unequal capacity; and there is a 190-gal. tank holding gas-oil for the auxiliary diesel set, and for the first few minutes of starting of the main gas-generator plants. In normal operation the gas-generator can burn coarse fuel, even into the bunker C range.

### Auxiliaries

Auxiliaries are numerous, and as they are all driven by their own electric motors this necessitated the provision of as much as 276 b.h.p. of auxiliary engine power, coupled to a 180-kVA. three-phase 50-cycle 220-V. generator.

The items of auxiliary equipment for which electric motors are provided include: two fans for the two main cooling groups; compressor for the air brakes, sanding, control system, etc.; high-pressure (1,400 lb. per sq. in.) compressor for air-starting of the gas-generator groups; fan for auxiliary engine cooling group; water pumps, fuel-transfer pumps, gas-oil transfer pump, and coarse-fuel circulating pump. Another requirement is that of the heating elements in the coarse-fuel system to ensure a free flow of oil at all times.

### Principal Dimensions

Principal dimensions of these two locomotives, which are classed as 060.GA in the French National Railways list, are: wheel dia. 41.5 in., bogie wheelbase 13 ft. 1½ in., bogie pivot pitch 35 ft. 8 in. (pivot location is slightly off centre of bogie wheelbase), total wheelbase 48 ft. 1 in., length over buffers 69 ft. 11 in., empty weight 112 tonnes. The fully laden weight is 120 tonnes.

GEORGE ELLISON LIMITED ADDRESS CHANGED.—The Cardiff office of George Ellison Limited has been transferred to 306, Western Avenue, Llandaff, Cardiff, tel. Cardiff 72701.

CUTS IN HIGH VOLTAGE TRANSFORMER PRICES.—The International General Electric Company has reduced prices of its high voltage distribution transformers, 22 to 69 kV. sizes up to 500 kVA, from four to 20½ per cent. The cuts cover ratings which were not included in the July 16 price changes. In the case of some ratings the prices have been adjusted to current market levels.

INCREASE OF VISITORS TO THE UNITED KINGDOM DURING AUGUST.—The British Travel & Holidays Association has announced that 237,870 overseas visitors arrived in Britain in August. This was a 20 per cent increase compared with the figures for the same month of last year. The most remarkable increase was in the number of visitors from Central and South America, the total for August of this year being 3,490 compared with 2,240 last year.

BUCKINGHAM-BANBURY PASSENGER SERVICE.—The passenger train service between Buckingham and Banbury Merton Street, London Midland Region, British Railways, is to be withdrawn from January 2. Radcliffe and Water Stratford Halts will be closed to passenger traffic and Fulwell & Westbury, Brackley Town, and Banbury Merton Street will be closed to passenger and parcels traffic. Parcels and passenger train merchandise for Fulwell & Westbury and Brackley Town will be dealt with at Brackley Central, and that for Banbury Merton Street at Banbury General.

## RAILWAY NEWS SECTION

## PERSONAL

Mr. J. R. A. Walker, Senior Engineer (Construction), Commonwealth Government Railways, Australia, has been appointed Chief Civil Engineer of that system.

Sir Cecil McAlpine Weir, a part-time Member of the British Transport Commission, whose death was recorded in our November 4 issue, was a Member of the

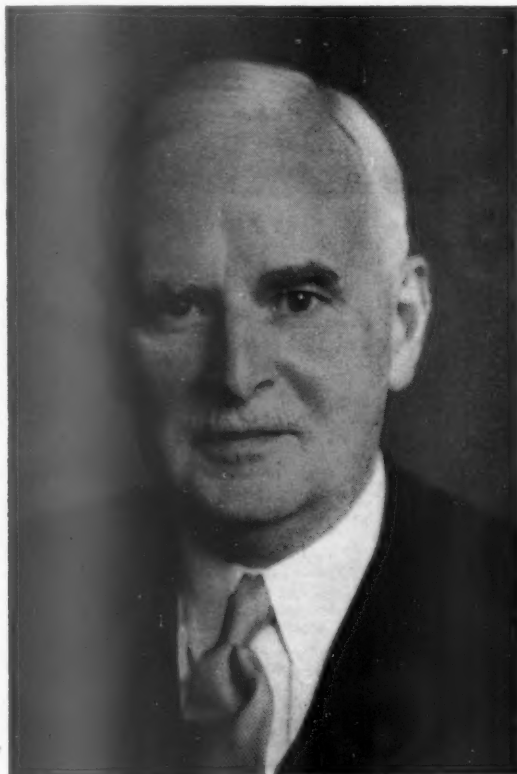
Montreal, and became Chief Clerk in that office in 1924 and Assistant to the Vice-President, Eastern Lines, 10 years later. In 1941 he was appointed General Superintendent, Ontario District, Toronto, and Assistant Vice-President in 1955.

Mr. J. V. Forrest, Assistant to the Vice-President of the Canadian Pacific Railway, who, as recorded in our October 14 issue, has assumed the senior executive duties formerly carried out by Mr. H. A. Greeniaus,

Mr. S. B. Zaheer, Divisional Superintendent, Bikaner, Northern Railway of India, has been appointed Chief Personnel Officer.

Mr. H. C. Orchard, Assistant Civil Engineer, Scottish Region, has been appointed Chief Civil Engineer of the Region.

Mr. T. R. V. Bolland, Traffic Superintendent, South Eastern Division Line Traffic Manager's Organisation, Southern Region, who



*The late Sir Cecil McAlpine Weir*

Part-time Member, British Transport Commission, 1955-1960



*Mr. T. R. V. Bolland*

Appointed Line Traffic Manager, South Eastern Division, Southern Region

Industrial & Export Council in the Board of Trade, Director-General of Equipment & Stores at the Ministry of Supply from 1942-46. From 1946-49 he served as Economic Adviser to the Control Commission for Germany, and in 1952 he was appointed head of the United Kingdom Delegation to the High Authority of the European Coal & Steel Community. His appointment as a part-time Member of the British Transport Commission was made in May, 1955. Sir Cecil Weir was a Past-President of the Glasgow Chamber of Commerce, Chairman of the British Tabulating Machine Co. Ltd., a Director of British Enka Limited, and of the Pyrene Co. Ltd., and a partner in Messrs. Schrader, Mitchell & Weir.

Mr. H. A. Greeniaus, Assistant Vice-President of the Canadian Pacific Railway, who, as recorded in our October 14 issue, has retired, started his railway service in Toronto in 1911. In 1919 he was transferred from the General Superintendent's Office, Toronto, to the Vice-President's Office,

began his railway service in 1920, and worked as a clerk in the transportation offices and as special representative in the office of the Vice-President in Winnipeg. In 1954 he was appointed Superintendent, Brandon Division, and a year later became Superintendent at Fort William. He was appointed General Superintendent of the Saskatchewan District in 1958, and promoted to his present position earlier this year.

We regret to record the death of Major I. B. G. Taylor, formerly a Director of the Benguela Railway Company.

We regret to record the death of Mr. V. Buchanan Atkinson, former Chief Engineer of the Kenya & Uganda Railways & Harbours.

Mr. L. J. M. Knotts, formerly Signal Engineer to the Scottish Region of British Railways, has joined Mullard Equipment Limited as Technical Adviser on the application of electronics to railway signalling.

has been appointed Line Traffic Manager, South Eastern Division, Southern Region, British Railways, joined the Southern Railway as a cadet in 1946. After three years' training in all departments, he gained experience in the three London traffic districts between 1949 and 1952. In that year he was appointed Assistant to the District Traffic Superintendent, Redhill, and became Assistant District Traffic Superintendent, Woking, in 1954. He was appointed Assistant to the Chief Operating Superintendent in 1957, and Traffic Superintendent in the South Eastern line traffic organisation when it was formed in 1958.

Mr. T. P. Strafford, formerly Divisional Traffic Manager, Nottingham, London Midland Region, British Railways, who, as recorded in our October 28 issue, has been appointed Divisional Traffic Manager, Manchester, began his railway career with the L.N.E.R. in 1919, and gained extensive experience in the Commercial and Operating departments. On the 1923 grouping he





**Mr. T. P. Strafford**

Appointed Divisional Traffic Manager,  
Manchester, L.M. Region



**Mr. J. H. M. True**

Appointed Divisional Traffic Manager, London  
(Central Lines), L.M. Region



**Mr. W. O. Reynolds**

Appointed Divisional Traffic Manager, London  
(Midland Lines), L.M. Region

was appointed to the control office at Kentish Town, and subsequently served in control offices and as Assistant District Controller in several areas. Early in 1938 he took charge of the trains office, Euston, under the Divisional Superintendent of Operation, Crewe, and, in January, 1940, was appointed District Controller, Rowsley. In March, 1944, he became District Controller, Carlisle, Northern Division, and, in 1946, District Operating Manager, Crewe. He returned to Carlisle in 1948 as the first District Traffic Superintendent. He was appointed District Operating Superintendent, Leicester, in 1949, Assistant Divisional Operating Superintendent, Derby, in 1953 and Divisional Operating Superintendent, Derby, in 1956. In 1958 he was appointed to the new position of Divisional Traffic Manager, East Midlands, and initiated the office and organisation of the Divisional Office at Nottingham. In 1959 he was made responsible for the modernisation programme of main line stations, and was chiefly concerned with the two projects at Euston and Birmingham (New Street). He now relinquishes these special duties to take up his new appointment.

Mr. J. H. M. True, Traffic Manager, Tyne & Wear, North Eastern Region, British Railways, with headquarters at Newcastle, who, as recorded in our October 28 issue, has been appointed Divisional Traffic Manager, London (Central Lines), London Midland Region, began his railway career on the former London & North Eastern Railway in the Goods Commercial Department in 1925. He subsequently filled appointments at Newcastle Forth and New Bridge Street Stations, and in the Newcastle District Office. He later became a Traffic Apprentice and was transferred to the Mineral Manager's Office at Doncaster on completion of his training period. After service in the Royal Corps of Signals and Royal Engineers (Movement Control) during the 1939-45 war, Mr. True was appointed an Assistant Director of Transportation with the rank of Lieutenant-Colonel on demobilisation. After the war he returned to the Mineral Manager's Office at Doncaster as Chief Clerk and, in July, 1947, was appointed Goods Agent, Doncaster. In February, 1948, he became Assistant to the Executive Officer (Mineral Traffic), Railway Executive, and, in December, 1951, took

up the position of Assistant to Commercial Superintendent (Coal), London Midland Region, Euston. He became District Goods Manager at Newcastle in October, 1955, and Traffic Manager, Tyne & Wear, North Eastern Region, in May, 1957.

Mr. H. A. Mugliston, Northern Divisional Traffic Manager, Barrow, London Midland Region, British Railways, who, as recorded in our October 28 issue has been appointed Divisional Traffic Manager, Liverpool, was educated at Clifton College and joined the former L.M.S. Railway at Bristol, in 1926. During the 1939-45 war, he served with the Royal Engineers (Transportation Section), and was demobilised with the rank of Lt.-Colonel in 1946. He was subsequently appointed Assistant District Traffic Superintendent, Chester, and in 1948 he became Shipping Traffic Superintendent, Belfast, in 1952. He was appointed District Goods Manager at Liverpool, in 1958, and a year later was promoted to the position which he now vacates.



**Mr. H. A. Mugliston**

Appointed Divisional Traffic Manager,  
Liverpool, London Midland Region

Mr. W. O. Reynolds, Planning Officer, London Midland Region, British Railways, who, as recorded in our October 28 issue, has been appointed Divisional Traffic Manager, London (Midland Lines), began his railway career with the L.N.E.R. in 1933. He was appointed a Traffic Apprentice in 1936, and, at the conclusion of his training in 1939, was appointed Assistant to the District Superintendent, Manchester. The following year Mr. Reynolds joined the Royal Engineers. He was demobilised in 1946 with the rank of Lt.-Colonel, awarded the M.B.E., and twice Mentioned in Despatches. He was appointed Assistant to the District Superintendent, Stratford, in 1946 and moved to a similar position at Doncaster the following year. He became Assistant District Superintendent, Lincoln, in 1948, and was appointed Assistant District Operating Superintendent, Nottingham, in December of the same year. In 1949 Mr. Reynolds became Assistant District Operating Superintendent, Doncaster, and, in 1952, District Operating Superintendent, Fenchurch Street. He was appointed District Operating Superintendent, Leeds City, in February, 1954, and in January, 1956, Assistant (Freight Services), Chief Operating Superintendent's Office. He became Assistant (Passenger Services), Euston, in 1957, Assistant Operating Officer, Euston, in 1958, and Planning Officer in 1959.

Mr. Claud Barrington, M.I.Mech.E., M.Inst.T., a Member of the Board of Management of British Road Services, whose death was recorded in our November 4 issue, was born at Portishead, Somerset, and educated at Colston School, Bristol. During the 1914-18 war he served with the 12th Battalion, the Gloucester Regiment. He was then appointed Chief Road Inspector for Scotland, for the Inland Waterways & Docks Department of the Royal Engineers. His career in road haulage began in Bristol in 1921, and he later extended his activities to London and Birmingham. In 1936 he was instrumental in the formation of Transport Services Limited, and was Managing Director of that organisation when it was acquired by the British Transport Commission in 1948. In 1941 he joined the Ministry of War Transport as Chief Road Haulage Officer and later became Director of Road Haulage. On the formation of the Road Transport Executive in 1948, he be-



**Mr. H. F. Sanderson**

Assistant Commercial Officer, North Eastern Region, 1949-60

came Member for Freight, and continued to be responsible for Traffic Matters until he became a part-time Member in January of this year. He was also General Manager of B.R.S. (Parcels) Limited during the early stages of its formation as a limited company in 1955, and had considerable influence on the formation of the Traffic structure of the organisation, of which he later became Chairman. Mr. Barrington was also chairman of the Atlantic Steam Navigation Co. Ltd., and an underwriting member of Lloyds.

Mr. H. F. Sanderson, Assistant Commercial Officer, North Eastern Region, British Railways, who, as recorded in our October 28 issue, has retired, joined the former North Eastern Railway Company as a Traffic Apprentice at York in 1921, and subsequently held various appointments in the Traffic Department and in the Headquarters of the London & North Eastern Railway at Kings Cross. In 1935, he became District Operating Superintendent, Cambridge, and from 1936 to 1945 was District Goods Manager, Newcastle, and was one of the few, at that time, to hold District Officer rank in both the Operating and Commercial Departments. In 1945 he became the first Principal of the London & North Eastern Railway Company All-Line Commercial School at Faverdale Hall, Darlington, and in 1949 was appointed Assistant Commercial Superintendent, North Eastern Region, York, later designated Assistant Commercial Officer. Mr. Sanderson has always taken a keen interest in the training of staff and has been a member of the Regional Training Committee for many years. He is the author of "Railway Commercial Practice," published in 1952.

Mr. T. C. West, F.R.I.C.S., Estate Agent & Rating Surveyor, London Transport Executive, who, as recorded in our October 14 issue, has retired, was a pupil of a leading West End land agent, and joined the London General Omnibus Company in 1912 as Surveyor to the Traffic Department. After four years of war service with the 56th (London) Division in France, he returned, in 1919, to the Underground Group of Companies, with which the L.G.O.C. had been merged since 1912, and was transferred to the Estates Department. In 1923, he became Rating Assistant and he was promoted to be Senior Assistant in 1935. In 1937, he was appointed an Officer of the London Passenger



**Mr. T. C. West**

Estate Agent & Rating Surveyor, London Transport Executive, who has retired

Transport Board, with the title of Assistant Estate Agent, and in 1940, he became Estate Agent. In this capacity he has been responsible for the management of surplus property and the arrangement of contracts for trading facilities on the railway system. His duties have also included the purchase of property for the development of the rail and road system and the sale of surplus premises to operation. He will continue to act in a consultative capacity to complete for London Transport certain specified property negotiations for which he has been responsible recently. Mr. West is Vice-President of the London Transport philatelic society.

Mr. J. I. McGillivray, B.Sc., A.R.I.C.S., A.A.I., Principal Executive Assistant in the Office of the Estate Agent & Rating Surveyor, London Transport Executive, who, as recorded in our October 14 issue, has been appointed Estate Agent & Rating Surveyor, and an Officer of the Executive, joined the department of the Estate Agent & Rating



**Mr. J. I. McGillivray**

Appointed Estate Agent & Rating Surveyor, London Transport Executive



**Mr. W. E. G. Hewings**

Appointed Assistant Secretary & Works Officer, London Transport Executive

Surveyor in 1937 to assist in the acquisition of property required for railway extensions under the 1935-1940 New Works Programme. During the 1939-45 war he served with the Royal Engineers (Transportation Branch) and with the Claims & Hirings Directorate in Malaya, reaching the rank of Captain. He was appointed a Principal Executive Assistant in September, 1958, and has been responsible to the Estate Agent & Rating Surveyor for the work of the department connected with Town & Country Planning, Rating, Acquisitions & Sales.

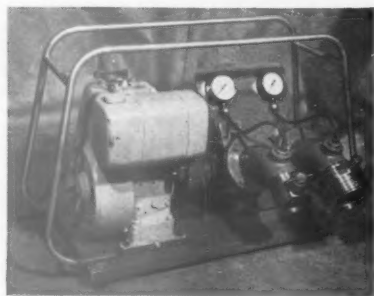
Mr. W. E. G. Hewings, LL.B., Works Officer, London Transport Executive, who, as recorded in our October 7 issue, has been appointed Assistant Secretary & Works Officer, joined the Legal & Parliamentary Office of the Underground Group of Companies in 1929. During the 1939-45 war he served with the 84th London Transport (A.A.) Regiment of the Royal Artillery (Territorial Army), and with the R.E.M.E. He returned to the service of London Transport in November, 1945, and after experience in the offices of the Executive and of the Architect, he became Personal Assistant to the Deputy Chairman in 1955. From January to April, 1957, Mr. Hewings' services were seconded, through the Colonial Office, to the Singapore Government, and he accompanied Mr. L. C. Hawkins, a Member of the London Transport Executive, to Singapore to assist in connection with the proposal to unify the road passenger transport services there. In 1957 he was appointed Secretary of the Executive Works Committee, and became Works Officer in May, 1959.

Mr. H. J. Billing has been appointed Sales Director of Metalastik Limited.

Mr. Lloyd A. Rager has been appointed Manager of the newly established Products Marketing Department of the LeTourneau-Westinghouse Company, Peoria, Illinois, U.S.A.

The following appointments have been made to the board of Directors of Brooke Tool Automation Limited, the new subsidiary of The Brooke Tool Manufacturing Co. Ltd.: Mr. A. G. B. Owen, Chairman; Mr. H. S. Holden, Managing Director; Mr. H. H. Evans; Mr. E. W. Hancock; Mr. E. W. B. Owen; Mr. K. G. Walton.

## NEW EQUIPMENT AND PROCESSES



### Portable Pump

**THE** Goodyear A.12 petrol-driven portable pump is designed for pumping out flooded basements and sumps, and is suitable for such duties in railway workshops and running sheds equipped with inspection pits.

The pump is of the positive-displacement rubber-to-metal type, based on the Archimedeian screw principle, and is fitted with a screwed connection on the exhaust side. It is direct-coupled to a Clinton Red Horse single-cylinder, air-cooled, vertical petrol engine developing 6.3 h.p. The complete set is mounted on a fabricated base-plate fitted with a tubular frame to facilitate handling. The pump will operate with a total head of 100 ft. including 27 ft. suction, and will run on snore. Pressure gauges are mounted on an inclined panel above the pump.

The overall dimensions of the set are 37½ in. long by 25½ in. wide by 21 in. high. The total weight is about 180 lbs.

Further details may be obtained from Holman Bros. Ltd., Camborne, Cornwall.

### Metal-Sawing Machines

**BARSON** metal-cutting circular sawing machines are electrically driven from 220/380-V. a.c. mains supply and are suitable for both straight and mitre cuts with the minimum wastage of material.

The machine illustrated below (left) is made in two sizes for cutting material up to 2½ in. and 3½ in. thick. Weights are 115 and 144 lb. which allows for a certain amount of portability. The saw blade is of super high-speed steel; the diameter is arranged to give the correct cutting speed for either iron and steel or non-ferrous metals. The swivelling vice is arranged so that it can hold tubes in addition to other sections.

The motor power is 0.9 h.p., sufficient, for example, to enable a 2-in. gas tube to be cut in a time of about 35 sec. Construction is simple with gears and shafts running in oil and with provision for adjustment. The scroll is hardened and has ball bearings. Prices including three-phase motor and machine vice are, Size 1, £80 15s.; Size 2, £90. An adjustable length-stop can be supplied at £2 2s. extra. Other extras available are a single-phase motor or three-phase pole-change motor to allow for variable cutting speeds, and a complete cooling arrangement with stand and pump to make the machine suitable for continuous heavy use.

The Barson-Rotor illustrated on the right-hand side enables mitre cuts to be made without swinging stock across the workshop. For this purpose the cutting head and motor turns through 45 deg. both to the left and right. The weight is 220 lb. and the price, with 0.85 h.p. three-phase motor, is £114 13s.

With both machines it is claimed that burr-free cuts are obtained and that precision-made replacement parts can be fitted without difficulty. Delivery can be made in about eight weeks.

Further details may be obtained from J. C. Neville Limited, 34, Priests Bridge, London, S.W.14.

### Diesel Crane

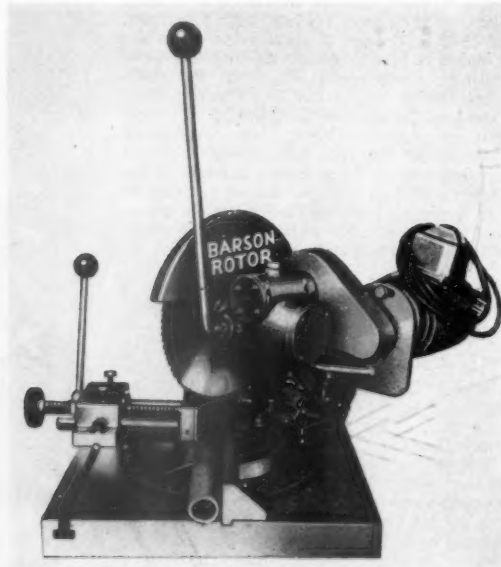
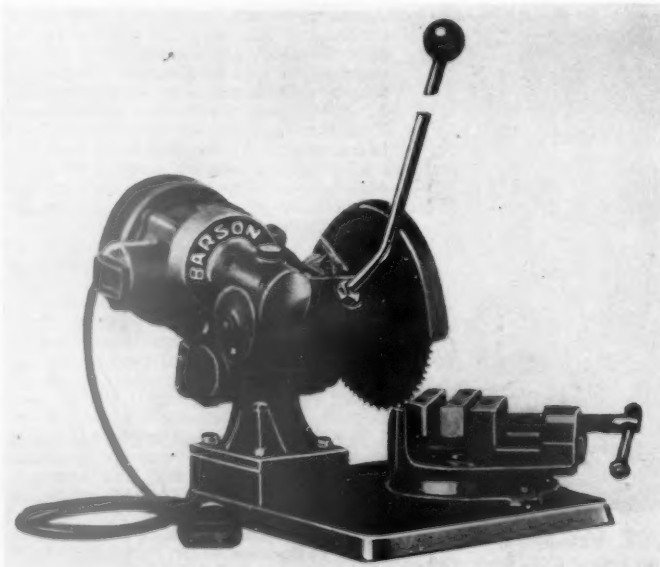
**THE** latest version of the Staffa 4-ton mobile diesel crane has a double-acting hydraulic ram to accelerate the luffing operation which can be performed when under load. Other improvements include more robust construction than hitherto and a new open A-frame which allows better forward vision. The overall height with the jib



lowered is limited to 10 ft. 3 in., which permits movement within most industrial buildings. The crane can travel down a gangway 6-ft. 6-in. wide and can negotiate a right-angle turn from a 13-ft. gangway.

Power for travelling and for hoisting is provided by a Ford Dexta three-cylinder water-cooled diesel engine developing 27 b.h.p. at 1,500 r.p.m. The fuel consumption is about 2 gal. per average eight-hr. working day. Transmission to the road wheels is via a single dry-plate clutch and forward and reverse speed gearbox through a propeller shaft and a new heavy-duty spiral-bevel differential in a cast-steel housing.

The hoisting gear is driven through a forward-and-reverse gearbox which is fitted with an automatic brake controlling the movement of the rope, and thence through a fan-cooled worm-reduction box with a 40:1 ratio. On the output shaft of this reduction box is mounted a grooved drum on which the rope is wound. This is of 6 x 37 best plough-





steel construction,  $\frac{1}{2}$ -in. dia., and 65 ft. long. The hoisting speed is 42 ft. per min. on a single fall of rope and 21 ft. per min. on a double fall. An automatic lock valve in the hydraulic luffing system prevents the jib from falling in the event of oil pressure failure.

The chassis, jib, and frame construction is of fabricated sections, welded and riveted together with two high-tensile tie bars to increase the rigidity of the frame. The front driving wheels have hydraulic brakes and carry twin pneumatic tyres. Steering is effected by a rear trunnion, also equipped with pneumatic tyres.

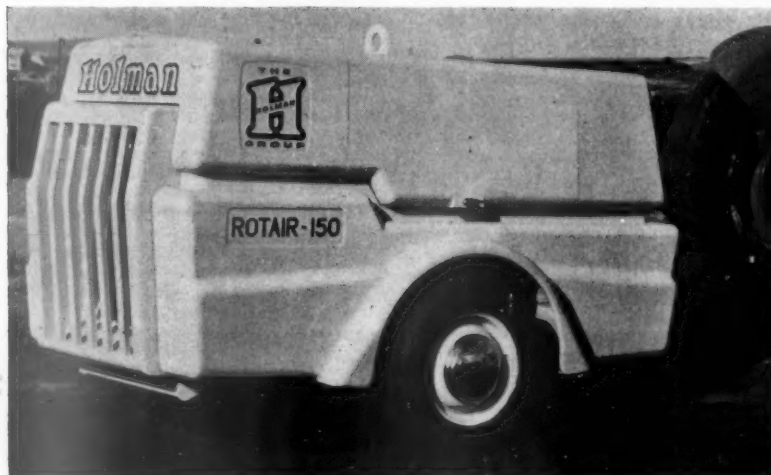
The maximum capacity of the crane with standard jib is 4 tons at 3-ft. clear outreach and  $1\frac{1}{2}$  tons at 10-ft. clear outreach, lifted free on wheels. Travelling speeds are 8 m.p.h. laden and 12 m.p.h. unladen.

Further details may be obtained from the manufacturer, Chamberlain Plant Limited, Crown Works, Southbury Road, Enfield, Middlesex.

### Mobile Screw-type Compressor

**THE** Rotair 150 portable air compressor is of the single-stage screw type driven by a Ford industrial diesel engine, and mounted on a two-wheel chassis. It is the smallest of the Rotair range, with a free air delivery of 150 cu. ft. per min., and will power three roadbreakers.

It is claimed that the temperature of the delivered air is at least 100° F. less than that produced by equivalent compressors of conventional design. The air delivery is free of pulsation. High efficiency and low wear



of the working parts are also claimed for this type of compressor. The oil storage and recovery system, which is built round the compressor unit, is designed to ensure rapid warming-up and efficient even cooling at the operating temperature, besides leading to mechanical simplification and a reduction in weight.

A glass-fibre canopy with hinged doors encloses the whole assembly, and can be lifted after the removal of six bolts and the disconnection of one pipe. The chassis is equipped with independent suspension for both wheels; brakes are provided with an automatic over-run control.

The overall length, including towbar, is 11 ft., the width 4 ft. 11 in. and the height to top of canopy 4 ft. 10 in. The wheel track is 4 ft. 4 $\frac{1}{2}$  in. and the weight is 2,530 lb.

Further details may be obtained from Holman Bros. Ltd., Camborne, Cornwall.



### Works Cars

**FOR** the transport of visitors or senior officials through large works a common practice is to provide some form of truck or car, ranging from the primitive "cab" at Crewe works of British Railways to a modern motorcar with special seats at the Fiat Mirafiore plant. A new development comprises these open-side nine-seater cars which, apart from wheels, axles, and drawbar, are constructed entirely in polyester, and so are of light enough weight for two or three of them, fully laden, to be pulled by a normal works electric battery truck or petrol-engined tractor.

Further details may be obtained from Linke-Hofmann-Busch G.m.b.H., Salzgitter-Watenstedt, Germany.

any one standard v.f.t. channel, while from controlled stations to master station it provides facilities for up to 156 remote indications or 12 telemetering channels or certain combinations of both. All repetitive circuits are assembled on plug-in printed wiring boards mounted in plug-in sealed boxes specially designed for reliable service under tropical conditions.

Further details may be obtained from Mullard Equipment Limited, Mullard House, Torrington Place, London, W.C.1.

### Centrifugal Pumps

**ALCON** THAMES single-stage centrifugal pumps are manufactured in sizes ranging from 1 in. to 5 in. and normally are motor driven, although petrol- and diesel-engine-driven versions can be supplied and belt drive also is available. They are offered in addition to the range of Alcon self-priming pumps.

The cast-iron pump casing is arranged for overhung mounting by means of an adaptor piece from the electric motor, allowing a direct drive of the impeller by the motor shaft. The gunmetal impeller is keyed on to the pump shaft and secured by a domed nut, and a renewable bronze sleeve is mounted on the shaft to protect it where it passes through the stuffing box. The stuffing box gland and the impeller rings are of gunmetal. Water passages are arranged to relieve stuffing hose pressure and give hydraulic balance. As an alternative, a mechanical spring-loaded rotary seal may be fitted.

The maximum performance of the largest size is 200 gal. per min. against a total head of 350 ft., or 700 gal. per min. against a total head of 220 ft. The maximum total suction lift is 15 ft. and the allowable suction pressure 30 lb. per sq. in. Deliveries can be made from stock.

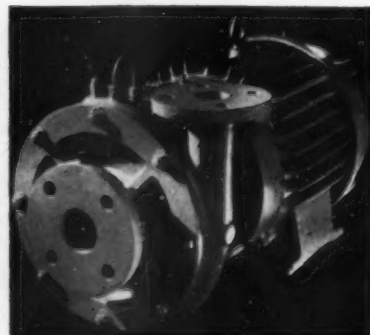
Further details may be obtained from Arthur Lyon & Co. (Engineers) Ltd., 6, Carlos Place, Grosvenor Square, London.

### Remote Control System

**THE** Mullard remote-control, remote-indication, and telemetering system is suitable for the control of unattended industrial and railway installations. It is a transistorised system and can be arranged to conform with the specific requirements of an installation.

It is designed to operate over standard 120 cycles per sec (50-baud) a.m. or f.m. voice-frequency telegraph channels, and can be supplied with or without line filters for 'splitting off' part of a telephone circuit. It can also be arranged to operate over 200-baud channels. Transmission from a remote-controlled station is rapid and continuous.

The system enables up to 150 remote-control signals to be transmitted from the master station to the controlled stations over



## Inauguration of Glasgow Suburban Electrification

*Formal opening of electrified services on the 50-cycle a.c. system North of the Clyde*

On November 5, Sir Brian Robertson, Chairman of the British Transport Commission, unveiled a plaque at Queen Street Station, Glasgow, in the Scottish Region of British Railways, when he inaugurated the suburban electrification which connects Airdrie and Helensburgh (Central) and includes four spur lines to Bridgeton (Central), Springburn, Milngavie, and Balloch Pier, respectively.

At the inaugural luncheon, D. H. Cameron, of Lochiel, T.D., D.L., J.P., Chairman of the Scottish Area Board, said he hoped that passengers on the newly-electrified services would grow increasingly and thus justify further extensions. The project had taken four years to complete, and he thanked all concerned for their help.

Some people had not always appreciated how Sir Brian Robertson had worked personally for modernisation and how great had been the responsibility he had borne since first he had become Chairman of the British Transport Commission. He had worked 24 hours a day and had inspired the Commission to ever greater efforts. "All of us," he said, "are really appreciative of the lead he has given us."

Speaking on the modernisation of Glasgow suburban railway services, Mrs. Jean Roberts, J.P., the Rt. Hon. the Lord Provost of Glasgow, said that Glasgow was, like so many other towns, becoming a city of negation. "No left turn," "No right turn," "No parking," "No entry," "No waiting," "No through road," "No loitering," "No litter." The only positive instruction was "Keep left," and perhaps it was significant that this was borne on a pillar of fire.

### Inglis Report

The residential section of Glasgow was dependent on efficient transport. Integration of transport had been discussed intensely since the Inglis Report had been issued in 1951. There were many difficulties.

There was complete good will between the Glasgow Corporation and the British Transport Commission. In all the negotiations regarding integration of transport, the pro-

vision of satisfactory services at reasonable cost to the travelling public had been agreed. The question of cost was important.

The electrification scheme was bound to take away a substantial volume of traffic from the Corporation's transport services. The agreement to curtail tram routes would involve the Corporation in a substantial expenditure not only in track reinstatement, but also in loss of capital in the Corporation trams.

Nevertheless, some advantages had accrued to the Corporation, including the comfort and convenience of passengers.

### Relief of Street Congestion

The job of the electrification was to direct traffic away from the congested streets of Glasgow. The Corporation was in full agreement with that aim. It would face up to its problems and to its agreement with the British Transport Commission, and to its responsibilities to the travelling public. Public transport would be more attractive, faster, cleaner, and more reliable, particularly at peak periods.

Perhaps passengers would show some respect for the facilities British Railways were providing, and not leave litter in coaches or on the stations. Many people did that thoughtlessly who would resent such untidiness in their own homes.

Mrs. Roberts congratulated British Railways on its approach to modernisation. As the daughter of a railway shopman in Springburn, she had always been fascinated by the movement of connecting rods and the starting of a railway engine. She congratulated Sir Brian Robertson and the British Transport Commission on their approach. That day celebrated the beginning of the first 50 miles of railway electrification, and everyone looked forward to electrification of the next 18 miles, and perhaps eventually to the Ayrshire coast.

Sir Brian Robertson, said that the problem of transport in the great and continually-growing city of Glasgow had occupied the minds of the City authorities, citizens, and visitors for many years and

particularly since the last war. Some 10 years ago a special report had been written on it.

He made special reference to the loss sustained by the Region in the death of Sir Cecil Weir, part-time Member of the Scottish Area Board.

Some years ago, Sir Brian Robertson had read the Inglis Report on Glasgow transport, and had held preliminary conversations with the city authorities, who had stressed the necessity of electrifying the suburban services. The problem was not a simple one, because those services were losing a great deal of money each year, and thought would be required before new money was invested in something which was uneconomic. The British Transport Commission felt it must get an assurance that, if provided, the electrified services would be properly used.

A series of discussions with the City authorities, including its very far-sighted and co-operative Transport Manager, resulted in the agreement of a scheme. It was entirely due to that that the Commission felt justified in taking the decision which led to electrification.

### First Phase of Scheme

This was only the first phase. The services, which would begin on November 7, would help people living north of the river. The problem of transport south of the river remained. Next year, the Cathcart circular services would be opened. There was a great deal more for which the Commission had plans. What, if anything, more would be done would depend on the encouragement the Commission received in the results of the services which had been inaugurated that day and on the continuation of that co-operation and co-ordination of transport which alone had made possible the day's inauguration.

A transmogrification of the first order had taken place at Glasgow Queen Street Station. Integration was a strong word, but the co-ordination of an efficient transport system was essential to a city like Glasgow. Sir Brian Robertson was convinced that, in modern times, the development and co-ordination of a good public transport system was essential to the reasonable function of a modern city. Parking facilities had been provided at 18 out of the 45 stations served. A survey had been made, and that new and additional facilities had already been pro-



Unveiling the commemorative plaque at Queen Street: (left to right) Lt.-Col. D. H. Cameron of Lochiel, Sir Brian Robertson, and Mrs. J. Roberts



The inaugural train from Queen Street Low Level Station to Hyndland on November 5.

vided at five stations, and more would follow. Season parking tickets were being offered experimentally.

Referring to cleanliness, he said that both new electric trains and station were now very clean indeed, but they needed to be kept clean. British Railways currently was making a drive all over the system to try to keep stations and trains clean and in that task they needed the co-operation of the public.

### Ealing Broadway Station to be Re-built

The station buildings at Ealing Broadway in the Western Region, British Railways, are to be demolished and reconstructed. The work is being undertaken in conjunction with the urgent renewal of the road bridge carrying the station buildings over the main and relief lines. Re-building should be completed by 1962.

The scheme involves the provision of one single station serving all Western Region lines, and the L.T.E. Central London and District Lines, with one main booking hall providing booking facilities for all three services. Left luggage and luggage in advance will also be dealt with in the central booking hall. Accommodation will be provided for the storage of bicycles with direct access to the street and the concourse of the hall. The existing District Line booking hall will be closed.

The new buildings are to be set back 35 ft. from the position of the existing buildings with a 24-ft. wide entrance based on the present building line; this will allow for setting back, should at any time road widening be carried out.

A new bridge leading from the booking hall will give access to all platforms. At platform level, new buildings will be provided on the Central London line and on the island platform between the Western Region main and relief lines.

#### Temporary Offices

Before the work is put in hand, a temporary booking office, to be provided between the Western Region and the District Line stations, will also deal with left luggage and so on. Stairways will lead to the Central London Line and Western Region up relief line platforms. Access to the remaining Western Region platforms will be by the existing footbridge at the Paddington end of the station; when the new buildings have been completed, this will be demolished.

### Four-Voltage T.E.E. Trains

Schedules have been fixed for the electric T.E.E. ("Trans Europ Express") trains now being built by Swiss firms. The sets can operate on four different voltages—1,500V. d.c. and 25kV. a.c., on the French National, 15kV. 16⅔ cycles a.c. on the Swiss Federal, and 3,000V. d.c. on Italian State Railways.

From May 28, 1961, a Paris-Milan train is to leave Paris-Lyon at 1.15 p.m., and to follow 5 min. behind the "Mistral" to Dijon, 195.3 miles in 143 min., at 81.9 m.p.h. average. It will use current at 1,500V. d.c. to Dole, then 25kV. a.c. to Vallorbe, where it will change to the Swiss 15,000V. a.c.; from Domodossola the Italian 3,000V. d.c. current will be used. Milan will be reached at 9.15 p.m., and the 8-hr. schedule will represent an average speed throughout of 63.8 m.p.h., stops and two frontiers included. Frontier formalities will take place in the train.

The corresponding eastbound T.E.E. ser-

vice will start from Milan at 2.55 p.m., and from Dijon again will follow immediately behind the northbound "Mistral" on a slightly faster timing, at 80.3 m.p.h. The 8-hr. schedule will be 1 hr. 50 min. less than that of any existing train.

As the eastbound Paris-Milan "T.E.E." will leave Lausanne for Milan at about the same time as the existing Italian "T.E.E." train "Lemano," the latter will start from Geneva at 7.40 instead of 5.29 p.m., leave Lausanne at 8.21 p.m. and reach Milan 2½ hr. later than now.

#### Gotthard Route

Because the curvature of much of the route does not permit high speeds, the new "T.E.E." Zurich-Milan services via the Gotthard will not show acceleration on the same scale as between Paris and Milan; their times over the 183 miles will be 4 hr. each way, average speed 45.8 m.p.h., and will be 23 min. less southbound, and 37 min. less northbound, than those of any existing train. From Zurich they will start at 8.45 a.m. and 12.40 p.m., and from Milan at 8.20 a.m. and 5.5 p.m. The relatively early start of the second train from Zurich will make it possible to reach Venice at 7.40 p.m., Genoa at 7.50 p.m. and Rome at 11.45 p.m. the same day. Northbound the 6-hr. Italian "Settebello" streamliner, reaching Milan at 4.50 p.m., and thus connecting with the 5.5 p.m. to Zurich, will make possible a 10½ hr. journey over the 576 miles from Rome to Zurich, at an average speed of 56.2 m.p.h., the fastest on record for this journey.

### Official Opening of Broxbourne & Hoddesdon Station

The new station of Broxbourne & Hoddesdon in the Eastern Region of British Railways, which is described and illustrated elsewhere in this issue, was opened by Mr. H. C. Johnson, General Manager of the Region, on November 3 in the presence of representatives of local government and a large number of other guests.

Speaking at the ceremony, Mr. Johnson said that the new station represented another forward step in Eastern Regional modernisation. In a fortnight's time, Sir Brian Robertson, Chairman of the British Transport Commission, would open the new electrification scheme between Liverpool Street, Enfield Town, Chingford, Bishops Stortford, and Hertford. Regional aims were simple—

it was desired to provide a thoroughly good service to customers and to improve the economics of the Region through more efficient working and the acquisition of many more customers. Regional experience had been very successful. There had been tremendous increases in traffic, and he was sure that similar success would be achieved in the area of Broxbourne & Hoddesdon Station.

This was the second time in four months that he had opened a station. This was the sister station to Harlow Town with which it shared similarities in design. The aim had been to create a centre worthy of the locality. The engineers and architects and everyone else concerned had done a worthy job.

When the electrification opened up at Broxbourne & Hoddesdon, there would be 39 trains during peak periods, instead of the present 27. In addition, journey time in both Up and Down directions would be improved by some five or six minutes. The whole of the service consisted of brand-new stock.

#### Catering for the Motorist

It was realised that the motorist must be catered for, and a car park with capacity for upwards of 80 cars had been provided. There was also a thoroughly modern coal and freight depot.

The continuing importance of integration of road and rail services was realised, and Broxbourne & Hoddesdon would be a bus as well as a railway station. It had been much admired for its track and platform capacity.

Quoting from "The Merchant of Venice," Mr. Johnson said: "Thou knowest that all my finances are at sea, neither have I the money or the commodity to raise the present sum." If the railways got the things it and the public deserved, they would do their best to provide improved services.

THE PULLMAN CAR CO. LTD. CHANGE OF ADDRESS.—On November 12, 1960, the registered office of The Pullman Car Co. Ltd. will be moved from 10, Mayfair Place, W.1, to 167, Victoria Street, London, S.W.1.

TURNER BROS. ASBESTOS CO. LTD. CHANGE OF TELEPHONE NUMBER.—From October 31, 1960, the telephone number of Turner Bros. Asbestos Co. Ltd., 14, Finsbury Circus, London, E.C.2, will be changed to London Wall 5471 (6 lines).



Mr. H. C. Johnson with Mr. C. J. Tilling, Chairman, Hoddesdon Urban District Council, after unveiling the commemorative plaque



## Parliamentary Notes

### Structure and Functions of B.T.C.

Among statements in the Queen's Speech at the opening of Parliament on November 1 was: "My Government will submit to you proposals for reforming the structure and functions of the British Transport Commission."

In the subsequent debate, Mr. Hugh Gaitskell, Leader of the Opposition, expressed his party's view that the Government wished, for doctrinaire reasons, to break up the B.T.C. "We are deeply concerned that this should not be done," he added. "We do not like the way in which the Stedford Committee was set up, a body which meets secretly and which is not producing any report. We are told that we shall hear the ultimate conclusions of the Government, but we shall not have the evidence on which they were based."

"He believed that he spoke also for Members opposite when he expressed the wish that the Government would pay a great deal more attention to the report on British Railways by the Select Committee. Not only was its analysis of the reasons for the present difficulties facing the railways most convincing, but it made no recommendation for reforming the structure and functions of the B.T.C. The Committee went a long way to assert that the present set-up was all right. It came down firmly in favour of the single integrated system and said that the general lines on which the Commission was now working were right."

It was a pity, Mr. Gaitskell went on, that the Government should be so absorbed with the decentralisation of the railways on very doubtful premises and so little concerned with the increasing monopolisation of the daily and evening newspapers of this country.

Sir Douglas Glover (Ormskirk—C.) said he was shocked that after all the money and effort that had gone into the so-called modernisation of the railways that at this stage the Government should be appointing a committee to consider the function of British Railways. Much of their modernisation would never reap any financial benefit. There was a long-term future for commuter services which ought to be better than they were today.

Mr. Scholefield Allen (Crewe—Lab.) said it would take £400,000 to body the ex-railway annuitants on the present level of the National Insurance pension. He hoped the Government would take this responsibility.

Dame Irene Ward (Tynemouth—C.) spoke at length on this subject.

### British Railways Hospitality

Mr. James Watts (Manchester Moss Side C.), on the motion for the adjournment on November 1, asked the Minister of Transport the cost of a luncheon given by the B.T.C. last month to celebrate the electrification of 31 miles of track from Manchester to Crewe. Six hundred people were asked to the luncheon at two hotels and free transport was provided. Much criticism had reached him from British Railways superannuitants and many employees who would like a better superannuation system provided before such festivities could take place. There were rumours that another jollification was to take place quite soon at Liverpool Street. He himself reckoned that the Commission would spend £18,000 on food and drink by the time electrification reached London.

Mr. Wedgwood Benn (Bristol S.E.—Lab.) said it was right for the Commission to draw attention, as any other business firm would, to its success, in this new technical sphere.

Mr. John Hay, Joint Parliamentary Secretary, Ministry of Transport, said he had no information to give to the House

because the Minister of Transport had definitely decided that he did not think in the circumstances that it would be proper for him in the exercise of his statutory power to ask the Commission to provide this information. The B.T.C. had something to publicise and had a good story to tell.

### "Guts Kicked Out" of Railways

Lord Lucas of Chilworth, speaking in the debate on the Address, in the House of Lords, said that the present state of the B.T.C. was a tragic and alarming story. It was now disclosed that the total loss of British Railways alone was £541 million. The vast bulk of that had been lost since 1951 by the present Government. After the passing of the 1953 Act, when the Government, to use an expression of a former Minister of Transport, "kicked the guts" out of the railways, nothing was done and on and on went the deficit. What had the Ministry of Transport been doing since 1953—"twiddling their thumbs"? The real trouble was that the Government never had a transport policy. The 1947 Act, with all its defects, was a policy. The 1953 Act was a pure shambles. Money had been spent at the rate of £160 million a year, but the country had never anything like that value out of it. After 12 months the Government at long last was taking his advice. The Minister had set up a study group. He would be more interested in the proposals of the Stedford Committee which the Government were not going to accept than he would be in the proposals they would accept. There was so much rumour and talk.

Lord Mills, Paymaster General, recalled that the present consideration of the B.T.C. as a whole was started by the Prime Minister on March 10, 1960, and said that it had been no part of the Government in its discussions since then to consider the hiving-off of any of its assets and their return to private ownership and control. The Government now expected to publish its White Paper proposals on the future of the B.T.C. before the Christmas recess.

Lord Latham said as a former Chairman of L.T.E., the real trouble was that the Government would not leave transport alone. What this country needed was not a system of transport that provided a series of facilities but one which provided a national service of transport. This could not be achieved unless there was a co-ordinated system which included with railway transport also road transport.

Lord Wolverton would seriously consider having some form of regional accountancy.

## Questions in Parliament

### Unemployed from Railway Workshops

Mr. H. J. Boyden (Bishop Auckland—Lab.) asked the Minister of Labour on November 7 what estimate he had made of the unemployment which will result in railway workshops from the cuts made in the B.T.C. modernisation programme; and what steps he was taking to find employment for those rendered redundant.

Mr. John Hare: It is too early to assess how far, if at all, production in particular railway workshops will be affected by the level of railway investment in 1961.

Mr. Boyden: In view of the very alarming rumours circulating in Shildon and Darlington about the railway workshops, will the Minister give a categorical assurance that the promise that stability of employment in these shops will be maintained until 1963 still holds good? and that if, after 1963, there has been some decline in the amount of work, then, in consultation with the Presi-

dent of the Board of Trade, he will see that steps are taken to deal with the redundancy?

Mr. Hare: It is impossible to assess how far particular railway shops will be affected by the level of railway investment. There is the closest co-operation between the B.T.C. and my Ministry, and that we are given advance notices if there are redundancies. We are given plenty of time to assist in placing those who are affected.

### Shortage of Signalmen

Mr. Barnett Janner (Leicester N.W.—Lab.) asked the Minister of Labour on November 7 what steps he was taking to ensure that men declared redundant in various industries were informed of the vacancies in other industries and activities, and given every help in filling them.

Mr. John Hare: My local offices keep in touch with employers, and when redundancy occurs or is imminent, they make special arrangements to help the workers affected to obtain other employment.

Mr. Janner: There is a serious shortage of signalmen on the railways. What action is proposed to bring that sort of case to the notice of the employers?

Mr. Hare: We encourage employers to warn us when there are redundancies so that we can fill vacancies wherever they may be. Signalmen would be included.

### Euston Station

Mr. Woodrow Wyatt (Bosworth—Lab.) asked the Minister of Housing & Local Government on October 25 what reply he had sent to the letter from the Royal Fine Art Commission concerning the proposed removal of the Doric Arch, Great Hall and Shareholders' Meeting Room at Euston Station.

Sir Keith Joseph, Parliamentary Secretary: The Minister has not yet replied because he is still considering the matter in consultation with the other Ministers concerned.

### Half-Fares

Mr. Harold Davies (Leek—Lab.) asked the Minister of Transport on October 27, in view of the fact that the official school-leaving age was 15 years, whether he would introduce legislation for children to travel at half-fare on public transport until the age of 15.

Mr. Ernest Marples, in a written answer: No. The official school leaving age is not the decisive factor. This is a matter for the appropriate fare-fixing body in each case, except where a local authority already has power to charge half-fare for children up to 15 years of age under the Public Service Vehicles (Travel Concessions) Act, 1955. On road passenger vehicles outside London there are already concessionary fares for children up to at least 15 years when travelling to and from school. On British Railways and on L.T.E. rail services educational season tickets for travel to school, college, and so on are available at one-half the adult rate for pupils aged up to 18; they may also travel to and from educational establishments on L.T.E. buses at half-fare.

## Staff and Labour Matters

### Pullman Car Staff

Under a recent agreement reached between the Pullman Car Co., and the National Union of Railwaymen, Pullman Car crews have received pay increases of 4s. to 6s. a week, or 3 per cent, back-dated to January 4 1960, which brings them into line with increases granted to British Transport Hotels & Catering Services refreshment car staff.

## Contracts and Tenders

### Mexican order for British Iron & Steel Corporation Limited

U.S. Industries Inc. (Great Britain) Limited has placed an order in excess of £100,000 with the British Iron & Steel Corporation Limited for supply by the Appleby-Frodingham Steel Company of special steel sections to be used in the construction of railway wagons in Mexico.

Kalmar Verkstads A.B. has received an order from the Swedish State Railways for 300 sets of Minden-Deutz bogies to carry various passenger coaches. Kalmar already has supplied 125 sets against a previous order.

The British Transport Commission, South Wales Docks, has placed the following contracts:—

Joseph Westwood & Co. Ltd.: supply of grabs, Newport Docks

Fred Myers Limited: supply of four electric platform trucks, for use at Cardiff Docks

Mountstuart Dry Docks Limited: overhaul of shb. *Foremost 44*. South Wales Docks

Yale & Towne Manufacturing Company: supply of 8,000-lb. capacity fork-lift truck, Swansea Docks.

British Railways, Southern Region, has placed the following contracts:

Taylor Woodrow Construction Limited: construction of new lift shafts, Bricklayers Arms Motive Power Depot

C. & T. Painters Limited: station renovations, Bournemouth Central

G. E. Wallis & Sons Ltd.: improved drainage, Feltham Marshalling Yard

James Robb & Son Ltd.: cleaning and painting of bridges, London (Western) District, and station renovations, Bramley & Mortimer

Aerocem Limited: repairs to viaduct, between Elephant & Castle and Loughborough Junction

E. C. MacDermot & Company: repairs to Crane Road, Feltham Station

Norriss Warming Company: improvements to ventilation, Slade Green Repair shop.

Caffin & Co. Ltd.: dismantling of dis-used railway viaduct, Portsmouth Harbour, and reconstruction of Avon River viaduct, Downton.

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

#### From Uruguay

25 main-line diesel-electric locomotives.  
8 diesel-electric shunting locomotives of 350 h.p.

6 diesel-electric shunting locomotives of 150 h.p.

The issuing authority is the Uruguayan State Railways (A.F.E.). Bids should be sent to La Seccion Licitaciones de la Gerencia General de la Administracion de Ferrocarriles del Estado, Montevideo, quoting tender No. 598/60. A "maintenance of offer" deposit of Ur.\$150,000 is required. The closing date is January 12, 1960. The Board of Trade reference is ESB/28536/60.

#### From Formosa:

1 35-ton diesel locomotive

1 25-ton diesel locomotive.

The issuing authority is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan, to whom bids should be sent. The tender No. is

GFB-7405. The closing date is November 26, 1960. The Board of Trade reference is ESB/28494/60.

#### From Victoria:

2,200 V. supervisory switchgear.

The issuing authority is the Secretary, Victorian Government Railways, Spencer Street, Melbourne, C.1, to whom bids should be sent. The contract No. is 61806. The closing date is November 23, 1960. No further information about this call for tenders is available from the Board of Trade. The Board of Trade reference is ESB/28173/60.

1 combined heavy-duty cold sawing, and four spindle drilling machine.

The issuing authority is the Secretary, Victorian Government Railways, Spencer Street, Melbourne, C.1, to whom bids should be sent. The contract No. is 61821. The closing date is November 23, 1960. No further information about this call for tenders is available from the Board of Trade. The Board of Trade reference is ESB/28172/60.

10 miles of cable, 2,200 V., two-core, lead sheathed, wire-armoured, section of each core 0.03 sq. in. as specified.

The issuing authority is the Secretary, Victorian Government Railways, Spencer Street, Melbourne, C.1, to whom bids should be sent. The contract No. is 61819. The closing date is November 16, 1960. The Board of Trade reference is ESB/28112/60.

#### From Greece:

10 four-wheel trailers, complete, for carrying track material, 4-ft. 8½-in. gauge.

The issuing authority is the Purchasing & Stores Department, Hellenic State Railways (S.E.K.), 12b Polytechniou Street, Athens, to whom bids should be sent. The tender No. is 4842. The closing date is November 11, 1960. The Board of Trade reference is ESB/28406/60.

16 items of oils and greases.

The issuing authority is the Purchasing & Stores Department, Hellenic State Railways (S.E.K.), 12b Polytechniou Street, Athens, to whom bids should be sent. The tender No. is 4833. The closing date is November 18, 1960. The Board of Trade reference is ESB/28405/60.

#### From Sudan:

1 locomotive shed of dimensions: length, 150 ft. c/c of stanchions; breadth, 50 ft. c/c of stanchions; height, 18 ft. from floor level to top of stanchions. Stanchions: 26 No. 10-in. x 5-in. x 30-lb. r.s.j. side stanchions 18 ft. high as per drawing No. CB/575/D. Eight 7-in. x 4-in. x 16-lb r.s.j. end stanchions of variable heights as shown on drawing No. CB/575/D.

1 goods shed as in drawing Nos. CB/599 and CB/600 of dimensions: length, 100 ft. between centres of stanchions; breadth, 50 ft. between centres of stanchions; height, 14 ft. 6 in. from platform level top of stanchions. Roof overhangs 4 ft. both sides lengthwise. Stanchions: 18 No. side stanchions 8-in. x 6-in. x 35-lb. r.s.j. 14-ft. 6-in. high 6 gable-end stanchions 8-in. x 6-in. x 35-lb. of variable heights as shown on drawing.

The issuing authority is the Sudan Railways, Stores Dept., Atbara. The tenders, accompanied by a 2 per cent deposit, should be sent to the Controller of Stores, Stores Department, Sudan Railways, Atbara. Any

tender not accompanied by a deposit will not be considered. The closing date is December 5, 1960. The tender No. is 2217. The Board of Trade reference is ESB/27656/60.

5 diesel engines.

The issuing authority is the Controller of Stores, Sudan Railways, Atbara, Sudan, to whom bids should be sent. The contract No. is 2240. The closing date is December 12, 1960. The Board of Trade reference is ESB/27894/60.

1 bushing press, hydraulically operated, together with all hydraulic accessories, including an electrically-driven pressure pump, motor and starter, all self-contained, and ready for connecting up to an existing electrical supply of 400/440 V. three phase 50 cycles.

The issuing authority is the Controller of Stores, Sudan Railways, Atbara, to whom bids should be sent. The tender No. is 2243. The closing date is December 19, 1960. The Board of Trade reference is ESB/28165/60.

#### From Pakistan:

1 electrically driven, heavy duty 60 cwt. drop stamp hammer capable of stamping jobs up to 28 in. long and 12 in. wide to accommodate die blocks 36 in. x 18 in. x 16 in. having max. stroke including flying 7 ft.

1 electrically driven, medium duty 15 cwt. drop stamp hammer capable of stamping jobs up to 14 in. long and 10 in. wide, to accommodate die blocks 18 in. x 15 in. x 15 in. having max. stroke including flying 6 ft.

1 electrically driven, light duty 10 cwt. drop stamp hammer capable of stamping jobs up to 8 in. long and 6 in. wide to accommodate die blocks 12 in. x 12 in. x 12 in. having max. stroke including flying 6 ft. 6 in.

4 diesel driven 3½ ton carrying capacity heavy duty trucks chassis

1 12-in. stroke slotting machine, electrically driven modern design and construction fitted with circular table of 3 ft. dia.

The issuing authority is the Chief Controller of Stores, North Western Railway, Empress Road, Lahore, to whom bids should be sent. The Tender No. is 25-S/4-G/Machinery/P6. Complete set of tender documents can be had from the Office of the Chief Controller of Stores, North Western Railway, Empress Road, Lahore. The closing date is November 28, 1960. The Board of Trade reference is ESB/28108/60. No further information is available at the Board of Trade.

#### From Iran:

2,600 of high-tension cable, 3 x 16 (earth), 6,000 V.

The issuing authority is the Purchasing Department (Tender Section), Ministry of Roads, Iranian State Railways, Tehran, Iran, to whom bids should be sent. The tender No. is 980/39. The closing date is November 26, 1960. The Board of Trade reference is ESB/27802/60.

#### From Egypt:

500,000 wooden sleepers, grade "B"

1,000,000 wooden sleepers, grade "C"

85,000 switch sleepers.

The issuing authority is the Egyptian Republic Railways. Tenders should be sent to the Purchases & Stores Department, Railway Building, 5th Floor, over Shubra Subway, Shubra, Cairo. The closing date

is December 10, 1960. The Board of Trade reference is FSB/28858/60. No further information is available at the Board of Trade.

#### From Egypt:

Supply of 171,000 ft. mild steel for steam and water.

The issuing authority is the Egyptian Republic Railways. Tenders should be sent to the Purchases & Stores Department, Railways Building, Shoubra Subway, Cairo. The closing date is December 26, 1960. The Board of Trade reference is ESB/27698/60.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Laccon House, Theobald's Road, W.C.1).

## Notes and News

**Remote Control of Signalling at Ealing Common.**—The signalling at Ealing Common, on the London Transport Executive District and Piccadilly Lines, has been modernised and brought under the remote control of the signalman at Acton Town. The changeover took place on the night of November 5/6. The signal-box at Ealing Common has been replaced by an interlocking machine housed in a special room at Ealing Common Station. This machine is controlled from a new push-button panel installed in the signalbox at Acton Town.

**British Electric & Allied Manufacturers' Association at Cologne Fair.**—The British Electrical & Allied Manufacturers' Association is presenting, in co-operation with the Board of Trade, a collective display of domestic electrical appliances at the International Household Goods & Hardware Fair at Cologne on February 24-27, 1961. This project is one of a series of important events during the Jubilee Year celebrating the 50th anniversary of the Association.

**Presentation to Mr. C. T. Henfrey.**—A presentation including a picture of Mount Elgon and a canteen of silver cutlery was made to Mr. C. T. Henfrey, Chief Engineer of East African Railways & Harbours, on the occasion of his retirement. Mr. G. P. G.

Mackay, Acting General Manager of the system, who, in the absence of Sir James Farquharson, made the presentation, paid tribute to Mr. Henfrey's work during a period of great construction and expansion. Mr. Henfrey's retirement was recorded on page 516 of our October 28 issue.

**B.I.C.C. Limited Middlesbrough Telephone Number.**—The telephone number of British Insulated Callender's Cables Limited, Middlesbrough branch, has been altered to Middlesbrough 43256-7-8.

**Birfield Group Developments.**—From November 7 the headquarters of the Birfield group of companies will be at its new London office, 20, Hill Street, London, W.1. The telegraphic address will become Beltistos, Audley, London, but the telephone number will remain unchanged at Grosvenor 7090. On the same day the automotive division will move to Chester Road, Birmingham, tel. Erdington 2191, and the railway division to Victoria Works, Millhouses, Sheffield 8, tel. Sheffield 364411.

**Floods in Southern Region.**—Electric train services on the third-rail system between London and Eastbourne and beyond and other services via Lewes were cancelled last weekend because of flooding in the Ouse valley at Lewes. A steam passenger service in lieu of the normal electric service was run between Eastbourne and Brighton. All services between Lewes and Seaford, and Lewes and Tunbridge Wells were cancelled for a period. A landslide between Wadhurst and Stonegate on the London to Hastings line via Tunbridge Wells necessitated single-track working between Tunbridge Wells and Hastings. Flooding between Paddock Wood and Marden interfered with services to Dover via Ashford.

**Coal Production in Britain.**—Annual production of 200 million tons a year is necessary in Britain if the National Coal Board is to sell coal in competition with gas "and the rest," according to Mr. Alfred Robens, Chairman-designate of the N.C.B., speaking at Blyth, Northumberland. By 1975 power stations could be taking over 100 million tons of coal a year if they continued to burn coal, and if power stations were built on the coalfield then their customers were on the doorstep. Costs, he stated, could be made sufficiently low to enable coal to compete with oil.

**North Wales Site for Ferodo Factory.**—Purchase is to be completed by Ferodo Limited of a 50-acre site near Caernarvon, for the erection of the firm's new friction materials factory. As a first stage, the factory will be 240,000 sq. ft. in area, with an adjacent canteen and service block. Initially, it is expected to employ about 500 people, although ultimately the figure may rise to 1,000. It was announced in July that Ferodo Limited was seeking a site in the area because suitable land and sufficient labour were no longer available at Chapel-en-le-Frith.

**Road Casualties in August.**—The total of 589 deaths on the roads last August is 43 more than in August, 1959. Road accidents also caused serious injuries to 7,922 persons, an increase of 176. Killed and injured together totalled 32,976, an increase of nearly 4½ per cent.

**British President of International Travel Conference.**—Mr. John G. Bridges, Director-General of the British Travel Association, and this year's President of the International Union of Official Travel Organisations, is President of the 15th International Conference and General Assembly of the I.U.O.T.O., the consultative body on travel to United Nations. The conference is being held in Buenos Aires. The agenda includes facilities at airports and seaports, and passports, visas, and currency control.

**E.I.A. Group Apprenticeship Scheme Award.**—Mr. A. J. Coleman has been awarded the first prize in the student apprenticeship class of the Engineering Industries Association Group Apprenticeship Competition, 1960, for his paper on "A Random Observation Work Study." The Engineering Industries Association Group Apprenticeship Scheme includes higher education in engineering subjects at Technical Colleges and also enables its student apprentices to receive considerable works experience at every level up to management.

**Reduction of First Class Fares from Scotland to London.**—From November 5, to March 25, 1961, the first class return fare from Glasgow Central or St. Enoch to London Euston or St. Pancras has been reduced from £10 16s. to £7 10s. The first class return fare from Edinburgh Waverley to London Kings Cross for Saturday-only travel has been reduced also from £10 13s. to £7 7s. 6d. The tickets are valid outward by any train on Saturday and return by any train on the same day as the outward journey or on the following Saturday. They are not valid for break of journey or intermediately on the outward journey.

**British Institute of Management Debate.**—At an open meeting of the Students' & Graduates' Section of the British Institute of Management, London Branch, at the Wellcome Hall, Euston Road, London, N.W.1, a debate on the question of "Industrial Relations" will be held. The principal speakers will be Sir William Robson Brown, M.P., and Mr. Jack Cooper, National Union of General & Municipal Workers. Mr. John Marsh, Director of the Industrial Welfare Society, will preside at the debate, which will begin at 7 p.m. on November 22. Further details may be obtained from Miss E. Ellett, Holborn 3456, ext. 13.

**Clifton Advertising Agency Partnership Dissolved.**—The partnership between Mr. D. W. H. Oxlade, Mr. J. R. Twynam and Mr. E. F. Wilkinson, conducted under the name of the Clifton Advertising Agency, Lincoln House, High Holborn, W.C.1, has been dissolved. Mr. Oxlade and Mr. Twynam will continue



Presentation to Mr. C. T. Henfrey, Chief Engineer, East African Railways & Harbours, on the occasion of his retirement



in association as Registered Practitioners in Advertising at the same address under the new style of Twynam & Oxlade. Mr. Wilkinson will practice separately as an Advertising Agent at 27/28, Finsbury Square, E.C.2, and will continue to use the style of Clifton Advertising Agency.

**High Duty Alloys Limited Change of Telephone Number.**—The Forging Division of High Duty Alloys Limited has changed its telephone numbers, which are now Redditch 4211 (day), and Redditch 4162 (night).

**New Office for Dagenite Batteries.**—The Victoria Street, London, office of Pritchett & Gold, and E.P.S. Co. Ltd., containing the Automotive Aircraft and Stationary Batteries sales divisions has moved to the company headquarters at Dagenham dock. The full address of Pritchett & Gold, and E.P.S. Co. Ltd., is: Dagenite Works, Dagenham Dock, Essex, tel: Dominion 0121.

**Railway Benevolent Institution.**—At a meeting in October the board of the Railway Benevolent Institution granted annuities to eight widows and one member involving an additional liability of £222 10s. per annum; 127 gratuities were also granted amounting to £1,202 10s. to meet cases of immediate necessity. Grants made from the Casualty Fund during the month of September amounted to £1,460 10s.

**Record Attendances at Industrial Welfare Society Meetings.**—More than 10,000 delegates from industrial and commercial undertakings of many countries will have attended the conferences, courses and tutorials of the Industrial Welfare Society within the twelve-month period ending in December. These attendance figures are the highest yet recorded. The Society has a total of over 3,500 members, and the number of employees thus represented is more than 10,000,000.

**Presentation to Mr. E. D. Trask.**—On the occasion of his retirement from the position of Assistant to General Manager (Special Duties), Eastern Region, British Railways, Mr. E. D. Trask was presented with a projector by his fellow officers. The presentation was made at Liverpool Street by Mr. H. C. Johnson, General Manager, Eastern Region. The illustration shows (left to right): Messrs. A. K. Terris, Chief Civil Engineer; A. W. Tait, Assistant General Manager; S. A. Claydon, Continental Traffic & Shipping Manager; R. A. Green, Signal Engineer;

J. W. Dedman, Line Traffic Manager (London, Tilbury & Southend); E. D. Trask; W. G. Thorpe, Line Traffic Manager (Great Eastern); H. C. Johnson; J. Bonham-Carter, Assistant General Manager; T. C. B. Miller, Chief Mechanical & Electrical Engineer; Pearson Armstrong, Regional Establishment & Staff Officer; W. Brown, Regional Accountant; and L. A. A. Taylor, Estate & Rating Surveyor.

**Arlesey & Henlow Goods and Coal Depot to Close.**—British Railways, Eastern Region, has announced that from November 28, Arlesey & Henlow goods and coal depot will be closed to all traffic. Collection and delivery services for parcels and sundries traffic will be continued by road, but consignments in full wagon loads will be dealt with at Biggleswade or Letchworth.

**Railway Correspondence & Travel Society Suburban Tour.**—The Railway Correspondence & Travel Society Great Eastern Suburban Rail Tour on November 12 leaves Liverpool Street Station at 2 p.m. The special train, which will be hauled by "J69" Class 0-6-0T, Number 68619, normally employed as a station pilot at Liverpool Street, will return to that station at 4.32 p.m.

**L.T.E. Underground and Bus Workers Art Show.**—London Transport Executive Underground and bus workers held a four-week art show at Charing Cross Underground station earlier this week. More than 100 oil paintings and water colours, drawings and examples of sculpture were on show to the public in the station booking hall. This was the 14th such exhibition.

**Tube Investments Limited Final Dividend.**—Tube Investments Limited has announced a final dividend of 9½ per cent on capital increased by a one-for-one rights issue and shares issued against the acquisition of Raleigh Industries Limited, compared with a forecast of not less than 8½ per cent. An interim dividend of 8½ per cent was paid prior to the rights issue. The 1958-59 total was 20 per cent.

**B.E.T. Omnibus Services Limited Capitalisation of Reserves and Interim Dividend.**—B.E.T. Omnibus Services Limited has allotted for distribution to ordinary stockholders registered in the books of the company at the close of business on October 12, 1960, new ordinary stock in the proportion of one new 10s. unit for every two 10s. units of issued ordinary stock held. The new ordinary

stock ranks *pari passu* in all respects with the ordinary stock previously in issue. The board has also authorised the payment on December 1, 1960, to holders of ordinary stock whose names appear in the register at the close of business on November 10, 1960, of an interim dividend of 3 per cent, free of income tax, on account of the year ending March 31, 1961. The new ordinary stock resulting from the capitalisation of reserves will participate in this interim dividend.

**Silentbloc Limited Annual General Meeting.**—At the annual general meeting of Silentbloc Limited on October 21, the Chairman, Mr. B. H. Dulanty, stated that during the past financial year, the group's trading profit had increased from £419,009 to £529,831. The profit before taxation had risen from £306,437 to £397,423. It had been decided to make another rights issue to shareholders in the proportion of two shares for every seven ordinary shares then held at a premium of 1s. a share. With the additional 1,100,000 shares, the issued capital would amount to £495,000 as against the authorised capital of £500,000.

**L.T.E. Bus Timetables Revision.**—Plans to give more regular and dependable red bus and trolleybus services will be put into operation by the London Transport Executive early in the New Year. There will be no change in the number of bus services operated but timetables for the routes, which are now run with many gaps because of lack of crews, are to be revised. The revision will bring timetables closer to the actual services now being run. To achieve this, existing timetables will be reduced in accordance with the current staff position in different districts. The operating schedules will be reviewed again when the staff situation is easier.

**Guest, Keen & Nettlefolds Limited Rights Issue.**—The board of Guest, Keen & Nettlefolds Limited has announced that a rights issue will be made to ordinary stockholders at the rate of one new ordinary share of £1 for each £6 ordinary stock held at the close of business on November 3. The total number of shares to be issued will be 6,582,011 at a price of 70s. each (of which 30s. is payable on or before December 15, and the balance on or before February 1, so that proceeds, after expenses, will amount to about £22.6 millions. An ordinary dividend of 5 per cent, less tax, from the trading profits of 1960 and a special non-recurring dividend of 2½ per cent not subject to taxation, from



Mr. H. C. Johnson, General Manager, and other officers of the Eastern Region at the presentation to Mr. E. D. Trask

profits realised during 1960 by a continuance of the policy of reducing the portfolio of investments, has been declared. Both these dividends will be payable on December 31, on the existing ordinary stock. The new ordinary shares will not rank for these payments.

**Tourist Traffic to Northern Ireland.**—A detailed survey made by the British Travel & Holidays Association, and the Northern Ireland Tourist Board has shown that 750,000 people a year travel from Great Britain to Northern Ireland, a fifth by air, the rest by sea. The survey took a year to complete, from November, 1958, to October, 1959, during which time many hundreds of passengers were interviewed on ships travelling between the two countries, and at Nutt's Corner Airport, Belfast. Included in the information obtained was the fact that two-thirds of the yearly traffic consisted of visitors to Northern Ireland. Holidaymakers alone account for nearly one-half of all visitors. The survey estimated that the total value of tourism to Northern Ireland each year was more than £11 million.

## Forthcoming Meetings

- November 11 (Fri.).—The Institute of Transport, Swindon Group, at the Engineering Society, Swindon, at 7.15 p.m. "Continental Container Services,"—Mr. Hudson-Efford.
- November 11 (Fri.).—The Institute of Transport, East Midlands Section, at Grand Hotel, Leicester, at 6.45 p.m. Annual dinner.
- November 11 (Fri.).—The Institute of Transport, Merseyside Section, Liverpool, at Adelphi Hotel, at 7 p.m. Annual dinner and visit of President.
- November 12 (Sat.).—The Railway Correspondence & Travel Society, Great Eastern Suburban Rail Tour.
- November 12 (Sat.).—The Railway Correspondence & Travel Society, Sussex & Kent Branch, at the Railway Hotel, Brighton, at 7 p.m. "And Now the L.M.S."—Dr. A. F. Cook.
- November 12-13 (Sat.-Sun.).—Southern Region Lecture & Debating Society. Tour of new signalling layout at Newcastle, York Railway Museum, York signalbox and control.
- November 14 (Mon.).—The Historical Model Railway Society, at Keen House, Calshot Street, London, N.1, at 7 p.m. "Henry Greenly (1876-1947): Profile of a Pioneer Model Engineer," Mr. E. A. Steel.
- November 14 (Mon.).—The Institute of Transport, at the Jarvis Hall, Portland Place, London, W.1, at 5.45 p.m. "The Handling of Freight Traffic between Ship and Shore," Mr. S. A. Finnis.
- November 14 (Mon.).—Institute of Traffic Administration, Birmingham Branch, at Cosmopolitan Club, Fore Street, Birmingham, at 7.15 p.m. An address by a British Railways speaker.
- November 15 (Tue.).—The Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, Birdcage Walk, London, S.W.1, at 5.30 p.m. "Refrigerated Transport on Railways," Mr. T. A. Eames.
- November 15 (Tue.).—Institution of Railway Signal Engineers, York Branch, at the Signalling School, Toft Green, York, at 5.30 p.m. "Problems of an S. & T. Maintenance Inspector," Mr. A. Moss; and "Problems of an S. & T. New Works Inspector," Mr. G. C. Hawkins.
- November 15 (Tue.).—The Railway Correspondence & Travel Society, Sheffield Branch, at Livesey-Clegg House, Union Street, Sheffield, at 7.30 p.m. "Tupence Coloured," Mr. J. I. C. Boyd.

- November 16 (Wed.).—The Permanent Way Institution, London Section, at Headquarters of the British Transport Commission, Marylebone Road, London, N.W.1, 6.30 p.m. "Morale and Incentive Bonus Schemes," Mr. J. C. F. Cameron.
- November 16 (Wed.).—The Railway Correspondence & Travel Society, Lancs. & N.W. Branch, at Douglas Hotel, Manchester, at 7.30 p.m. "Locomotive Performance," Mr. G. Clarke.
- November 17 (Thu.).—Institute of Traffic Administration, Glasgow Branch, at Kenilworth Hotel, Glasgow, at 7.30 p.m. Visit by Chairman of Council.
- November 17 (Thu.).—Diesel Engineers & Users Association, at 18, London Street, London, E.C.3. "The Practical Application of Torque Converters," Mr. R. G. Hill.
- November 17 (Thu.).—British Railways, (Western Region), London Lecture & Debating Society, at Headquarters, Staff Dining Club, Paddington, at 5.45 p.m. "The Organisation & Activities of a Gas Board," Mr. C. H. Chester.
- November 18 (Fri.).—The Railway Correspondence & Travel Society, London Branch, at the Railway Clearing House, London, N.W.1, at 7.15 p.m. "The Grimsby & Immingham Tramway," Mr. J. H. Price.
- November 18 (Fri.).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, joint meeting with the Institute of Transport, at Board Room Dock Manager's Office, Swansea, at 6.45 p.m.
- November 19 (Sat.).—The Permanent Way Institution, East Anglian Section, at Ipswich. Annual Lunch and General Meeting.
- November 19 (Sat.).—The Railway Correspondence & Travel Society, North-Eastern Branch, at the Mechanics' Institute, Darlington, at 6 p.m. "Modernising the railway in the Darlington District," Mr. J. B. Hollingsworth.

## Railway Stock Market

With main attention centred on the Wall Street reaction to the U.S.A. presidential election, stock markets showed a waiting attitude at the beginning of the week. Financial results coming to hand emphasise that conditions in export trade are more difficult, particularly in the U.S.A., where it is hoped that trade will expand now election uncertainties have been removed.

Among foreign rails, Costa Rica ordinary stock changed hands down to 35, but was again quoted to give a middle price of 36½; the 6½ per cent second debentures were 110. Chilean Northern 5 per cent first debentures were 53½, Brazil Rail bonds 5½, and Guayaquil & Quito assented bonds 67. Paraguayan Central prior debentures were again quoted at 14, and business at 4 was marked in Salvador Railway consolidated stock.

International of Central America common shares were \$25 and the consolidated stock \$101½. United of Havana second income stock remained at 6 with the consolidated stock again quoted at 1. Mexican Central "A" bearer debentures changed hands around 59½. Antofagasta ordinary stock held its recent rise to 16, though there was some profit-taking in the preference, which came back from 35½ to 33½: the 4 per cent perpetual debentures were 49½.

Canadian Pacific reflected Wall Street, coming down to \$36½ a new low for the year, before rallying to \$38, which compared with \$37 a week ago. The 4 per cent preference stock was 62½ and the 4 per cent debentures 62½. White Pass shares were \$10½.

Nyasaland Railways shares were 9s. with the 3½ per cent debentures 44½. Midland of Western Australia second mortgage stock has changed hands at 26.

West of India Portuguese capital stock was 110½ and the 5 per cent debentures 94½. Barsi Light Railway stock was again quoted at 17½.

Once again very little business passed among shares of locomotive builders and engineers, but this was largely a reflection of the uncertain conditions ruling in stock markets generally at the beginning of the week.

Charles Roberts 5s. shares fell from 8s. 9d. a week ago to 8s. 3d., and Beyer Peacock from 7s. 4½d. to 7s., while Westinghouse Brake eased from 42s. 6d. to 42s. 3d. at which there is a yield of just over 5 per cent on the basis of the 11 per cent dividend of last year.

In other directions, Gloucester Wagon 10s. shares have changed hands around 11s. and Wagon Repairs 5s. shares were firm at 18s. 6d. North British Locomotive were 6s. 6d. with few buyers about because it is realised that recovery in earning power is likely to take some time. Birmingham Wagon shares eased to 29s. 10½d.

G. D. Peters were 13s. 9d. Associated Electrical at 44s. 9d. failed to hold all an earlier small rise. English Electric were 33s. 6d. and General Electric 33s. 3d., the prevailing view in the City being that the talks in progress are likely to approve the idea of a merger through a holding company into which both companies would transfer their shares. Crompton Parkinson 5s. shares were 10s. 9d.

Reflecting the general trend earlier in the week, Dowty Group 10s. shares lost a few pence at 37s. 3d., Pressed Steel 5s. shares were 29s. 10½d., while Ransome & Marles 5s. shares came back to 25s. and Pollard Bearing 4s. shares were 48s. 6d. 10½d. Birmid Industries were good at 67s. 9d., Hopkinsons eased to 111s. 3d. and Mather & Platt to 47s. 6d.

Guest Keen were marked down to 88s. following the recent issue news. Steels have been more active because of higher dividend hopes.

## OFFICIAL NOTICES

**GRADUATE** Engineer, 32, ten years locomotive industry, drawing office and works, inland and abroad, present salary £1,200 p.a., considers change. Box No. 77, The Railway Gazette, 33, Tothill Street, London, S.W.1.

### Foreign Employment ROADMASTER

**ENGINEERING GRADUATE** preferred; minimum of two years engineering training essential.

Require two years varied railroad engineering service, or five years in direct charge of track crews. Will supervise 135 men maintaining 45-mile railroad assign work, order materials, be responsible for safety, make regular detailed inspections of roadbed and all track on main line, sidings and yards, bridges, tunnels, etc. Will make engineering calculations relating to maintenance and use of structure and equipment. Must speak Spanish. Married or single candidates acceptable.

Excellent opportunity large copper company, Chile, South America. Two year contract with transportation both ways for you and family. Basic salary \$525.00 to \$650.00 per month depending upon age and experience of applicant. Box 6, The Railway Gazette, 33 Tothill Street, S.W.1.

